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## *What it takes...* TO BUILD THIS TEAM

Today's most powerful deterrents against aggression are the airmen and officers of the Strategic Air Command and their global B-36's. No combination of men and machines — by their mere existence — has ever been such a force for peace!

To build this team, Convair and the United States

Air Force developed production and training techniques unequalled in the history of aviation. From the beginning both the B-36 and its crews had "growth potential" designed into them. And instead of obsolescence, the atomic age made this team even more formidable in national defense.

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# CONVAIR

AIR

FEBRU

One phase of Defense Department's program to maintain a stable aircraft industry when plane orders decline is off to a good start—modification and overhaul of military aircraft is being put back in plants of original manufacturers.

Examples: Convair-Ft. Worth, cyclic maintenance of B-36's; Boeing-Wichita, B-47 modifications; North American-Fresno, just completed remanufacture of T-6G trainers, will modernize early F-86D's; Douglas, converting Navy R4D's to R4D-8's.

Modification centers, however, are also being used by Defense. Example: Temco-Greenville is slated to overhaul C-47's and is converting C-97's to hospital planes for Military Air Transport Service.

Future U.S. high-speed transport is still a vague shadow. Military and airlines can't decide between straight jet, turboprop and souped-up compound piston engine.

Boeing 707 is scheduled to fly in August; prototype, in conservative test program, will log 350 hours by early '57. Lockheed reportedly plans to close design of its L-193-45 by next May; prototype will fly in '56. Douglas' plans parallel Lockheed's.

Some engine makers are urging airframe companies to push turboprop designs, which will be cheaper to operate if engines develop as planned. Turboprop's fate will be decided in USAF program to test the powerplant in each major transport type.

Regardless of jet progress, another round of piston engine transports, using souped-up Wright Turbo-Compounds, is being considered. New engines would boost Convair 340 to 425 mph, DC-7 and Super Connie to over 400 mph. Curtiss-Wright is said to be putting \$5 million into the engine's development.

Britain's jet and turboprop transport lead has suffered. Loss of one of the Britannia prototypes will slow Bristol's program at least six months. Comet grounding, rightfully or wrongfully, has also hurt.

Decision on "third round" of aluminum expansion has been postponed by Office of Defense Mobilization.

Navy-Air Force survey of aircraft industry was inconclusive on need for the metal. They'll conduct a re-survey, submit revised estimates by May 15.

Aluminum capacity is now about 2.7 billion pounds yearly, will reach 3.1 billion by end of 1954 as a result of first two expansion rounds.

Future of titanium production is also indefinite. Special ODM group is determining need; military has warned aircraft industry to increase use of titanium before producers cut output.

Airlines can look for a new mail pay structure. Rate levels won't be affected; idea is to overhaul present system, make it easier to administer. CAB may have plan ready in four to six weeks.

In the new structure, you can expect:

Elimination of groupings (domestic industry is now divided into six groups, each with a different service rate, ranging from 45¢ to \$2.58 per ton-mile).

One base rate for all carriers, but with adjustable features to cover short-haul segments, low density points, etc.

Management outlook for Northwest Airlines is confused. Harold Harris, president, on leave recuperating from illness, will return before end of the month.

But several strong factions on NWA board of directors have been openly opposing Harris, and a test of strength on the much-factioned NWA board appears a certainty.



## The Washington View

### DME is Still With Us

Although the announcement was obviously soft-pedalled to soothe the opposition, CAA Administrator Fred B. Lee last week gave the industry the long-awaited assurance that civil Distance Measuring Equipment is to remain in the "Common System" of air navigation.

Threat of the alteration or replacement of the civil system by the much-discussed military TACAN system is gone. The latter has been retired to an evaluation by the Air Navigation Development Board for "possible future application" in the Common System.

Next major to-do in the air navigation field that has to be settled is concerned with the U.S. position on long-range navigation aids in the International Civil Air Organization, a subject now getting top level handling in ACC.

Until last August U.S. had only supported Loran, with the exception of making a concession to ICAO to support Consol at Newfoundland and Iceland. Best guess now is, however, that ultimate U.S. position will be to recognize both Loran and Consol on an equal basis in ICAO.

### Ryan's Move to NACA

It was a dim victory for the Administration but indicative of the drive behind Commerce Department officials' desire to get an Eisenhower appointment for Oswald Ryan this month when Republican Ryan was named to NACA in addition to, not instead of, Democrat CAB Member Joseph P. Adams.

The original Ryan-for-Adams program was dropped after it back-fired when picked up by the press. To avoid adding discord to CAB, Adams' NACA spot was left untouched, but Commerce Under Secretary Murray vacated his Republican post in favor of Ryan.

Box-score: Republicans gained no additional seats in NACA (which isn't usually open to political patronage anyway); CAB gained one seat—now has two; CAA and Commerce lost one—now have none; and Ryan has his first signed designation from President Eisenhower.

### Another Non-Sked Review?

Will the Senate Commerce Committee's aviation hearings, which are scheduled to begin March 1, simply become another forum to review problems of the non-scheduled airlines? There are those who believe the proposed hearings will be but a change in scenery from what has previously transpired with the Senate Small Business Committee.

It was less than a year ago the 13-member Small Business Committee issued its latest and most controversial report, "Future of Irregular Airlines." Its recommendations promised the moon, if only CAB would see the light.

Although the writing of the committee's report has often been attributed to Larry Henderson, who is gone now, the committee members who signed it have not changed. (Henderson resigned as committee aide February 1 and reportedly is seeking an industry connection.)

Four of those senators are also members of the Commerce Committee which now proposes to review the McCarran bill, a measure that would place all segments of the industry under strict regulatory control.

Two are Republicans—Senators Schoepel and Duff—and two are Democrats, Senators Hunt and Smathers.

Senators Duff and Smathers have also recently been assigned to the new aviation subcommittee, which is expected to play a large part in the forthcoming proceedings.

### Who Will Use Romulus?

Curtiss-Wright Corp.'s bid for use of the Navy's new \$50 million plant at Romulus, Mich., has the Navy sold but not the Air Force. C-W wants the modern, model facility for production of its J67 turbojet and spare parts.

Since C-W is primarily an AF contractor, Air Force permission is a necessary prerequisite before the Wood-Ridge, N. J., manufacturer can go into Romulus.

The Air Force is holding back, it now appears, because it would prefer to have C-W make use of an idle AF reserve plant, rather than use the Navy facility.

The Navy, of course, is anxious to find a tenant for Romulus, not having an occupant lined up since the cancellation of its contract for production of the Westinghouse J40 by the Lincoln-Mercury Division of Ford Motors.

The overall situation is still receiving top level consideration by both Air Force and Navy brass. In addition, Sen. Homer Ferguson (R., Mich.) has shown a strong and active interest in present negotiations to find a user for the new Michigan facility. Ferguson is chairman of the Senate Armed Services Appropriations subcommittee.

... PREBLE STAVER



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ers,\* make it the ideal design for meeting the requirements of today's new aircraft.

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\* Now being flown on: Douglas DC-7, DC-6, DC-4 aircraft; Convair 240 and 340 series; Martin 202's and 404's—as well as on other famed Lockheed Constellations.



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February 15, 1954

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#### OTHER PUBLICATIONS

American Aviation Daily, a daily news service for the entire industry, \$200 per year. Managing Editor: Keith Saunders.

American Aviation Directory: twice yearly listing of products, people and organizations, \$7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules and fares \$13.50 per year in USA; \$14.00 in Canada; \$15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

American Aviation Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news. \$150 per year. Managing Editor: Wallace I. Longstreth.

## When & Where

- Feb. 18-19—Institute of Radio Engineers American Inst. of Electrical Engineers transistor circuits conference, Philadelphia.
- Feb. 21-23—3d Annual Texas Agricultural Aviation Conference, Texas A&M College, College Station, Texas.
- Feb. 24-26—Ohio-Indiana Agricultural Aviation Conference, Ohio State University, Columbus; write Ohio Aviation Board, 501 Wyandotte Building, Columbus, for program.
- March 5-7—Society of Women Engineers National Convention, Mayflower Hotel, Washington, D.C.
- Mar. 22-25—Institute of Radio Engineers National Convention, Waldorf Astor Hotel & Kingsbridge Armory, New York.
- Apr. 12-14—Airport Operators Council, 10th Annual Meeting, Tampa, Fla.
- Apr. 12-15—Society of Automotive Engineers Aeronautic Meeting, Production Forum & Aircraft Engineering Display, Statler Hotel, New York.
- Apr. 21-24—2d Annual Student Paper Competition sponsored by Institute of the Aeronautical Sciences, Texas Section, Adolphus Hotel, Dallas.
- Apr. 22-23—Radio Technical Commission for Aeronautics, Franklin Inst., Laboratories, Inst. of the Aeronautical Sciences (Philadelphia Section), & Inst. of Radio Engineers (Phila. Section) Joint Meeting, Franklin Institute, Philadelphia.
- Apr. 22-23—American Inst. of Electrical Engineers, conference on feedback controls, Claridge Hotel, Atlantic City, N. J.
- April 27-28—Air Traffic Conference, semi-annual meeting, Miami Beach, Fla.
- Apr. 29-30—American Society of Tool Engineers, 10th biennial industrial exposition, Convention Center, Philadelphia.
- May 5-7—3d Int'l Aviation Trade Show sponsored by Aircraft Trade Show, Inc., 71st Regimental Armory, New York.
- May 7-8—National Convention & Air Meet National Inter-Collegiate Flying Assn. University of Illinois, Champaign-Urbana, Ill.
- May 10-12—Institute of Radio Engineers National Conference on Airborne Electronics, Dayton Biltmore Hotel, Dayton, Ohio.
- May 16-19—American Association of Airport Executives, National Convention, Standiford Field, Louisville, Ky.
- June 7-10—Society of Plastics Industry, 62d National Exposition, Cleveland, O.
- June 20-23—Aviation Distributors & Manufacturers Assn., mid-year mtg., Stanley Hotel, Estes Park, Colo.
- June 21-24—Inst. of the Aeronautical Sciences, annual summer meeting, LAS Building, Los Angeles.

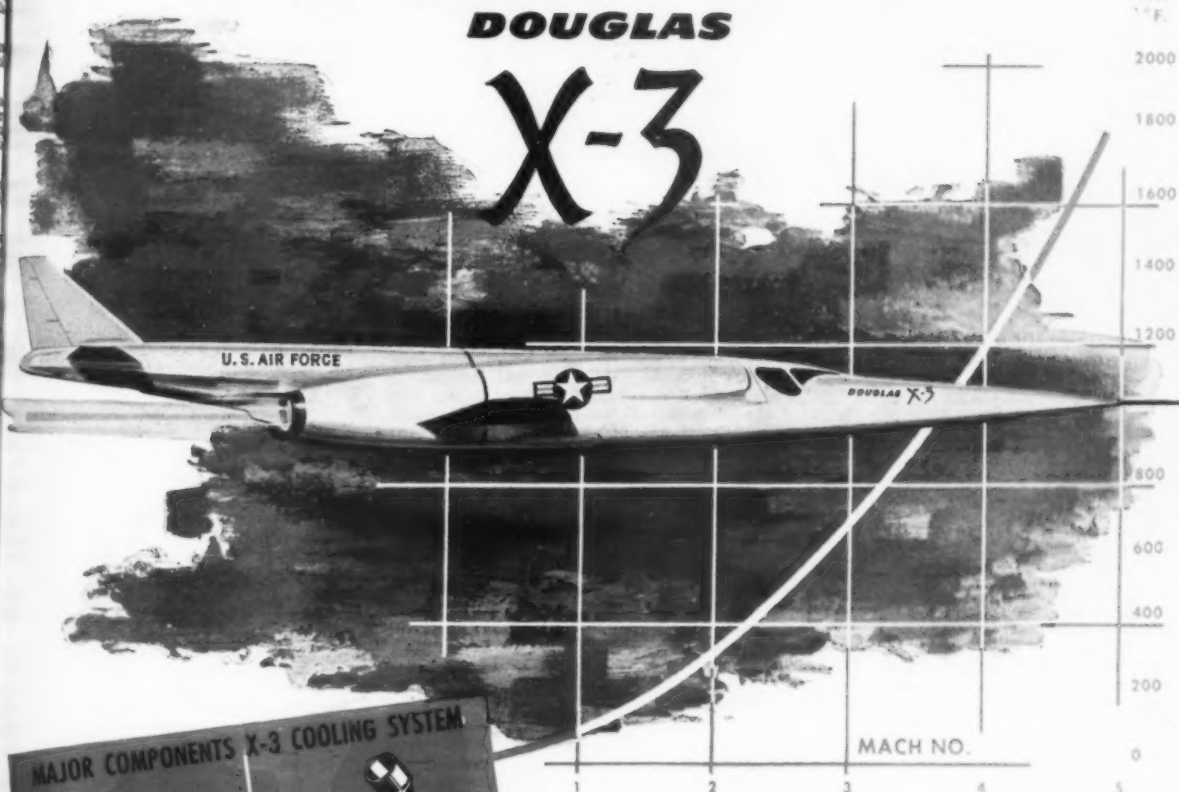
## INTERNATIONAL

- Apr. 5-6—Society of Plastics Industry (Canada) Inc., 12th annual conference, Mount Royal Hotel, Montreal.
- Apr. 10-13—German Air Show, Rhein-Main Airport, Frankfurt, Germany.
- Apr. 21—ICAO Conference on coordination of air transport in Europe, Strasbourg, France.
- Apr. 26-May 2—IATA Technical Conference, Barcelona, Spain.
- May 12-14—Engineering Institute of Canada Annual Meeting, Quebec.
- May 31-June 11—Canadian International Trade Fair and National Air Show, Toronto.
- Sept. 7-12—SBAC Show and Flying Display, Farnborough, England.

# STRATOS COOLS THE

DOUGLAS

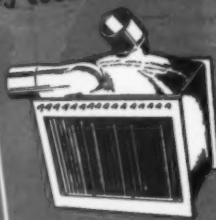
# X-3



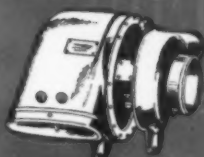
## MAJOR COMPONENTS X-3 COOLING SYSTEM



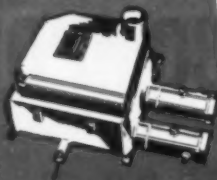
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# Letters

## SIZE PLACE

To The Editor:

With interest I read your article in *AMERICAN AVIATION* of December 21, 1953, under "En Route" about your trip to Liechtenstein.

In the description of this principality you say "Here is the smallest state of Europe . . ."

However Liechtenstein is a very small country indeed, but it is not the smallest one! Just for your information I give you below a statement of the smallest and smaller states and areas of Europe, from which you will learn that Liechtenstein only appears in fifth place in order of size. Based on population, Liechtenstein is only third smallest. In both cases the Papal state of Vatican City is the smallest one.

|                           | Area        | Population |
|---------------------------|-------------|------------|
| Vatican City              | 108.7 acres | 1,025      |
| Monaco                    | 370 acres   | 23,973     |
| Gibraltar                 | 2 sq. mi.   | 23,232     |
| San Marino                | 38 sq. mi.  | 14,545     |
| Liechtenstein             | 62 sq. mi.  | 11,102     |
| Malta                     | 95 sq. mi.  | 235,000    |
| Andorra                   | 191 sq. mi. | 5,231      |
| Free Territory of Trieste | 320 sq. mi. | 262,500    |

The saying "Who will not keep a penny shall never have many" is relevant to this case.

Trusting you will be convinced that only the sake of enlightenment induces me to write you, please receive greetings from another small country, The Netherlands.

J. VAN DAM

De Bruynstraat 80  
The Hague, Netherlands

(It depends largely on the definition of the word "state."—Ed.)

## STATURE

To The Editor:

I think that any publication which runs an article like that written by "Mr. X" on page 17 of your January 4, 1954, issue gains real stature.

The opening paragraphs are an example of clear thinking and first rate writing. I pray that the article is effective!

ALFRED L. WOLF

Wolf, Block, Schorr and Solis-Cohen  
Packard Building  
Philadelphia 2, Pa.

## COPY CATS?

To the Editor:

The article by "Mr. X" in your January 4 issue was of special interest to me, as I've actually worried about this basic problem for a number of years. While I am intensely certain of the wonders of American ingenuity and production, I have for years had a nagging fear—one that your Mr. X has publicly laid bare for the first time I have ever seen.

Unquestionably, our way of life is the best there is on earth. But what's wrong with it, that it permits the sort of thing described by Mr. X to go on year after year? Why is it that the United States, in the fields of military weapons as well as in commerce, has become a nation of "copy cats" rather than inventors?

What we used to accuse the Japanese of is, in reality, abundantly true of the United States itself! We achieve our greatness all too often these days by grabbing someone else's ball and running with it.

Here are a few examples of non-American inventions or developments that many of us just assume are the result of true-blue American ingenuity and inventiveness:

Insulin (Canadian), DDT (German), the atom-smashing theory (English), aspirin (German), X-ray (German), the typewriter (Austrian), photography (French and English), the pneumatic tire (Irish), stainless steel (English), the adding machine (French), the automobile magneto (German), the bicycle (Scotch), the match (English), the gas burner (German), cellophane (Swiss), Portland cement (English), internal combustion gasoline engine (German), high-octane gasoline (Russian), linoleum (English), the locomotive (English)—and even the neon lights in our saloons, which were invented by a Frenchman!

The U. S. military, of course, may lay claim to some outstanding examples of boneheadedness in the field, starting with the Wright Brothers' first airplane itself (which got its first real recognition in Europe!).

But what about such non-military things as penicillin, sulfas, detergents, cameras and Heaven knows how many hundreds of other products—most of which Americans actually think were invented and developed by ingenious Americans.

One of the great landfalls to American industry, it appears, was the Office of the Alien Property Custodian, which scooped up hundreds of German developments as war booty, and parceled those developments out to American industry.

Throughout our lives we have been led to believe that this sort of thing is almost the exclusive God-given right of

23 LEADING WORLD AIRLINES HAVE SELECTED TURBO COMPOUNDS



NATIONAL AIRLINES  
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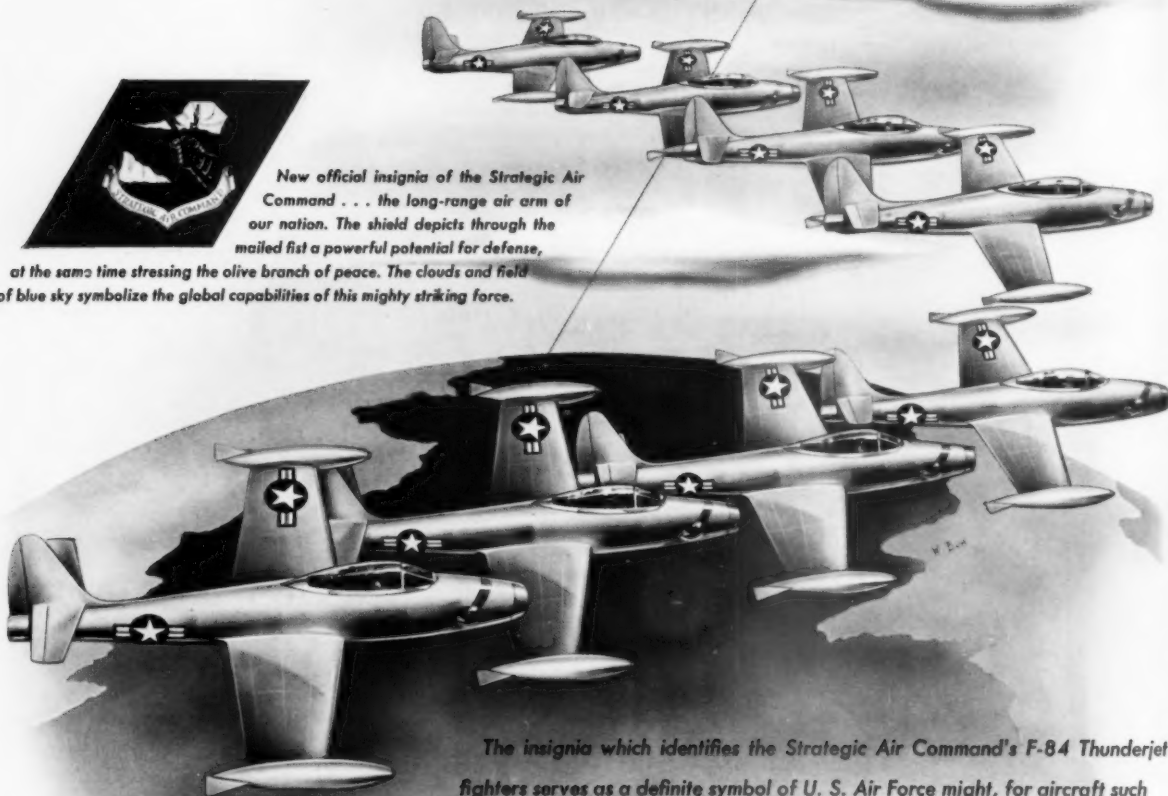
S-A-S serves more cities in Europe  
than any transatlantic airline



# Salute to the **STRATEGIC AIR COMMAND**



New official insignia of the Strategic Air Command . . . the long-range air arm of our nation. The shield depicts through the mailed fist a powerful potential for defense, at the same time stressing the olive branch of peace. The clouds and field of blue sky symbolize the global capabilities of this mighty striking force.



The insignia which identifies the Strategic Air Command's F-84 Thunderjet fighters serves as a definite symbol of U. S. Air Force might, for aircraft such as the Thunderjets have established their role as an integral and versatile part of strategic air power. Group flights on the same day, such as from the U.S.-to-England and from U.S.-to-Africa, both non-stop . . . using in-flight refueling,\* emphasize the valuable role the F-84 is playing in SAC as a strategic jet fighter airplane with amazing mobility. >>

For these accomplishments and other assuring demonstrations of our air power, credit must fall to the laudable teamwork of each individual in the Strategic Air Command, and to their Commander, General Curtis E. LeMay.

★AUGUST 20, 1953.  
TURNER A.F.B., GEORGIA TO NOUASSEUR, AFRICA. (31ST STRATEGIC FIGHTER WING)  
TURNER A.F.B., GEORGIA TO LAKENHEATH, ENGLAND. (306TH STRATEGIC FIGHTER WING)

**REPUBLIC AVIATION**

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are and democratic peoples. Our own record seems to indicate otherwise.

Our country is the finest on earth. I got that way because it is made up of progressive, strong-minded, independent people, and those are the people that will make the United States even greater. I deeply hope that people like Mr. X will somehow be able to awaken the American people to the grave handicap he has outlined in his article.

I have strong fears that, if we don't "do something" about this stifling of American inventiveness and ingenuity, our days of freedom and prosperity may very well be numbered.

MAX KARANT  
Assistant General Manager

Aircraft Owners and Pilots Association  
P. O. Box 5960  
Washington 14, D. C.

MR. X

To the Editor:

I don't know when any article has aroused the interest and great surge of immediate response—all favorable—that was provoked by the one which appeared in your January 4 issue written by Mr. X.

Thank God somebody has joined in bringing this matter into focus. It is thoroughly consistent with AOPA's contention that the presently constructed airworthiness regulations offer little in the way of practical safety, but contribute dreadfully to the inertia and lack of progress in personal aircraft design development. I believe that Grover Loening and Benny Howard have recently shared similar opinions.

Congratulations for your courage and convictions in running this article. I hope it is the beginning of a real rip-roaring campaign on your part. If so, it will be a great contribution to the progress of American aviation, and by that I mean national aviation progress as well as the magazine which wholeheartedly carries that title AMERICAN AVIATION.

J. B. HARTRANFT, JR.

Aircraft Owners and Pilots Association  
Washington, D. C.

## ROANOKE'S COFFEE SHOP

To the Editor:

We note your criticism of the coffee shop at the Roanoke Municipal Airport in the January 4 issue of AMERICAN AVIATION in which we regretfully concur. Our local objections to this situation have resulted in plans to definitely improve our coffee shop.

We hope that you will visit Roanoke again in the near future and find our eating facilities greatly improved. If you will announce your presence on future trips it will be greatly appreciated, as I would like to meet and talk with you about our industry, on which you are unusually well informed.

M. L. HARRIS

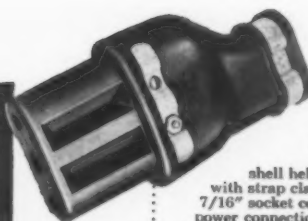
Manager  
Roanoke Municipal Airport  
Roanoke, Va.

(Congratulations to all hands at Roanoke for taking constructive steps to alter an unsatisfactory situation.—Ed.)

FEBRUARY 15, 1954

# CANNON battery PLUGS & receptacles

*a complete and varied line  
to meet your every need*



AN2551—Rubber shell held together with strap clamps. Two 7/16" socket contacts for power connection. Rating 400 amp. One 5/16" socket contact for relay and/or indicator light on instrument panel. This plug (without cable) offers you greater flexibility than similar plugs with integral molded cable.

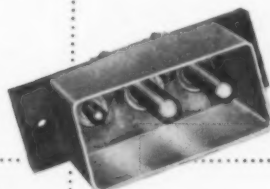


AN2552—Mates with AN2551. Lamin bakelite or melamine bonded glass mat-laminated insulation. Available with or without shield.



MS25019—Similar to AN2551 except for rectangular mating section. BuAer approved.

MS25018—Mates with MS25019. BuAer approved. Features rectangular shield. Two 7/16" and one 5/16" pin contacts. Insulated with strong melamine bonded glass, mat-laminated.



11751-1—Small in size. Light in weight. Used for batteries built to AN-W-B-141 specifications. Easy to connect, using center wheel and gear. Eliminates spark hazards from terminals striking any part of the ship during installation. Two socket contacts for B&S No. 00 wire connection. Rating 600 amp. Shell of molded phenolic. Handwheel die-cast aluminum.



AN3114—External power receptacle. Tellurium copper contacts, silver-plated. Insulated with melamine resin. With or without synthetic rubber cover.



11749-1—Mates with 11751-1. Offers full protection against hazardous accidental spark. Aluminum alloy housing.



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The Modern Color-Sound  
Motion Picture



This 30-minute film shows how to select electrical connectors. Good for you! Good for your associates! At no cost to your firm except 2-way transportation charges.

Write TODAY requesting "CONTACT" film. Address: Modern Talking Picture Service, Inc., 45 Rockefeller Plaza, New York 20, N. Y.

Need battery connectors?  
You'll find the Cannon series of plugs and receptacles the most complete and varied line available... meeting practically all military and industrial specifications.

A full line of single, double, and three contact fittings are available, quickly, for all types of aircraft and stationary power, including oil field applications.

Only a few are shown here.

All are exceptionally rugged units, designed and built for safe, positive connection and long-lasting service.

Write TODAY for AN and Cannon Battery Connector Bulletins.

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## There'll be a new jet in the sky

America's first jet transport, now being constructed in a Boeing plant near Seattle, is currently "on schedule." According to present plans it will take to the air by early fall, 1954.

This airplane is a prototype — an experimental model of wholly new design. Boeing is building it to demonstrate to the military and to commercial operators the potentials of a high-speed, jet-powered transport of ample range and capacity.

A jet tanker version of Boeing's new aircraft would complement strategic air power's swift jet bombers. It could fly

with them on long-range missions and refuel them in flight — at their own choice of altitude and speed. Commercial airlines are increasingly interested in a jet aircraft that offers great speed, and performance which will permit profitable operation.

By investing its own funds in the development of a jet transport, Boeing is providing an advantage that will be shared by future purchasers. Design and construction of this prototype now will make possible the building of production airplanes at an earlier date. It will also afford an early opportunity to prove out

engineering, production and operational details. This prototype has behind it the thousands of hours of research and flight experience Boeing has gained with the B-47 Stratojet and the eight-jet B-52 Stratofortress.

This background of experience with large, multi-jet aircraft is unmatched anywhere in the world, and is a vital part of Boeing's 37-year history of pioneering successful new types of airplanes. You can depend upon the integrity of Boeing research, design and engineering to make the coming prototype an aircraft that will contribute greatly to the new jet age of flight.

# BOEING

AMERICAN AVIATION



## EDITORIAL

# Genghis Khan to Missiles

THE OTHER DAY we received a brochure which made us catch our breath as we turned the pages. Seldom has been our privilege to read such a potent message in such succinct style.

It is titled "The Changing Concept of War" and its author is Ted Holliday, president of Land-Air, Inc., of Chicago. We would be remiss if we didn't pass on to you the following direct quotations (we have added bold face type) from what appears to be a remarkably lucid document of foremost interest to you and

everybody else in the U. S.

WAR IS CHANGING and our concept of preparedness must keep pace with that change.

The time has passed when our country can prepare for the next war by leaving it to the experience of the last war.

The element of surprise is so great and the potential damage so enormous that no one country can possibly win the next war without every civilian being able and willing to do a much greater part.

The forces of combat which we might call our Armed Services were primarily elements from the first days of warfare. Their role reached a low ebb in feudal days when the knight in shining armor sometimes decided major issues in a single combat. Not even the armies, let alone civilians, were hurt by such warfare. **Armies as such reached a peak in the first world war.**

With the advent of strategic air combat in the second world war, much warfare went over the heads of the ground armies. Now with the coming of missiles, it is quite likely that the war will go over the head of all armed services.

The logistic support of warfare has climbed steadily and as weapons become more and more complicated, the need from industry for the materials of war will increase still more.

The civilian was an unwilling victim of war in the days of Genghis Khan, when he was so often murdered and raped by the victorious armies. In subsequent centuries, his role became less and less of a chore, seldom exceeding that of any unwilling host.

This is particularly true in our own country, where the last two wars have given the civilians a better living if anything. Lush pay with overtime hours has almost created a desire that wars could go on forever.

Now that bombardment aircraft and long range missiles are a reality, **the civilian is on the front line.** He and the industry which he serves now become the primary target of the enemy. He will suffer the casualties rather than the soldier.

Therefore, the trend of wars is towards a greater civilian role and a decreasing military role.

The trend of the military is downward. Future missiles will be launched from an area far distant from any possible front lines and they will hit targets far in the rear. **In short, the war will go over the heads of the soldiers.**

However, this future portends the need of an elite corps of military thinkers who can plan, supervise, and lead the efforts of the entire population rather than that of the relatively few military. **The grand strategy is the specialty of the military while survival of the country is the task of the civilian.**

It is easily possible that our military will eventually become a small compact officer corps who will direct the military activities of 160,000,000 civilians instead of leading combat operations of a few million soldiers.

Industry carries the logistic load. They design, develop, and deliver the weapons of war. For that reason, **their plants become the primary target of the enemy, as destruction of those plants will destroy our ability to wage war.**

Since industry must inevitably carry any major effort, it is only reasonable that they should be a part of weapon design from the earliest stages. It is believed that serious consideration should be given to transfer weapons research from arsenals and gun factories directly into industry at the outset. Competitive research by industrial concerns can easily provide greater and faster advances than can the relatively non-competitive work which is now being done in the government arsenals.

**The stimulation of competition is the greatest possible incentive towards progress.**

**A**LL OF THE FOREGOING was used by Mr. Holliday to press home his worthy argument that the use of civilian contractors is an advantage to the Armed Services. He provided numerous illustrations to bolster his points and was especially effective in showing the waste in dollars and manpower in using enlisted personnel for non-combat duty.

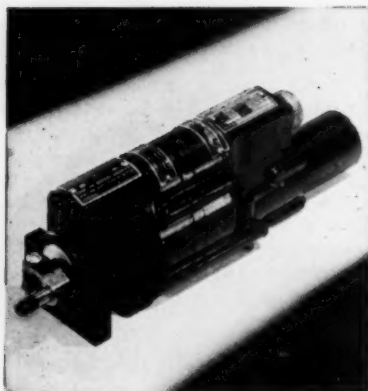
Is the Pentagon gearing its thinking to the changing concept of warfare which Mr. Holliday so vividly outlines? It is, we think, but very, very slowly. The extravagance in manpower enjoyed by theater commands in World War II could not be repeated in a future war without complete disaster. It will be impossible, manifestly, to put the bulk of civilians in uniform and still maintain the industrial flow.

The front line in any major conflict from now on is the home front. Mr. Holliday is to be commended for his contribution to airpower thinking.

... WAYNE W. PARRISH



*has been around  
(and still is!)*



Trim Trol was developed in 1947 to actuate trim tabs in the prototype Grumman Albatross. This actuator proved as rugged as the new amphibian, functioned perfectly despite prolonged exposure to salt water. Soon afterward, McDonnell selected Trim Trol for the original Banshee. It has been used in every model of the series.

The same basic model continues to satisfy all demands, although aircraft design has changed radically. Trim Trol is now specified equipment in the Chance-Vought Cutlass, the Douglas Skyknight and A3D.

Meeting the requirements of MIL-A-8064 (USAF), it weighs 3½ lb., has ultimate static capacity of 2000 lb. in., and produces 300 lb. in. operating torque through 160 degrees.

The story of Trim Trol is only one example of Airborne's pioneering in the actuator field. As the evolution of aircraft design poses new problems, look to Airborne for the solutions. For more information on Trim Trol, and other actuators, see our literature in the I.A.S. Catalog.



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## Industry Spotlight

Layoffs announced by industry firms since the first of the year now affect more than 10,000 workers. Included are Chance Vought (3250 by the end of 1953 because of F7U-3 stretchouts), Lockheed's California plants (3000 by fall), Fairchild (2000 because of C-119 stretchouts), North American-Columbus (1100 because of F-86 stretchouts), Republic (400 because of F-84F stretchouts), North Milwaukee (400 because of R-2800 phase-out), A. O. Smith (200 because of B-26 landing gear stretchouts).

Makeup of the new 137-wing Air Force, revealed by AF Chief of Staff Nathan F. Twining, calls for 55 Strategic Air Command wings vs. 57 in the old 143-wing force. Two B-47 wings were dropped. Air Defense Command, originally slated for 29 wings, gets five more all-weather and three day fighter wings, ending up with 37. Tactical Air Command was reduced from 40 to 34, while the non-combat troop carrier wings were sliced from 17 to 11.

AFL-Machinists union has begun a drive to oust the CIO-Transport Workers as bargaining agent for 11,000 mechanics and ground service personnel working for American Airlines and Pan American World Airways. IAM holds bargaining rights on most other airlines. No-raiding pact is in effect between the AFL and CIO but neither the IAM nor the TWU has signed the agreement as yet.

General Motors Corp. has finally been hit substantially by the policy of stretching out and canceling production at second sources. Buick-Oldsmobile-Pontiac plant at Kansas City, building Republic F-85F's, had its orders cut as did Buick's Flint, Mich., facility, turning out Wright J65 Sapphire engines. Republic was untouched by the F-84F reduction, but Wright shares equally with Buick in the J65 cancellation.

USAF is now performing about 7500 flight refuelings each month, transferring 1.2 million gallons of fuel in the process. Both the probe and drogue (Flight Refueling, Inc.) and the flying boom (Boeing) method are being employed but the emphasis seems to be shifting over to the probe and drogue technique.

Even though USAF's new money request for 1955 is \$200 million less than was voted by Congress last year, the service will have plenty of money to spend over the next few years. On July 1, 1953, USAF had \$28.1 billion in unexpended funds and was granted \$11.4 more for fiscal 1954. Total: \$35.9 billion. This year will see spending of \$15.6 billion, and \$300 million more in lapsed funds will go back to the Treasury, leaving \$23.6 billion. New request is for \$11.2 billion plus \$1 billion for construction. If Congress approves, USAF will thus have \$35.8 to spend after July 1, 1954. The anticipated spending of \$16.3 billion for fiscal 1955 would permit the AF to enter fiscal 1956 with \$19.5 billion.

Santa Monica production line has now turned out more than 460 Douglas DC-6 type aircraft for U. S. and foreign airlines, the Navy, and the USAF. Included are DC-6's, A's, B's, C's, and DC-7's for airlines, R6D's for the Navy and C-118's for the Air Force.

Boeing 707 jet transport now under construction (company designation 367-80) will be a much simpler airplane than the same firm's B-377 Stratocruiser. The jet will have 75 instruments on the panel vs. 126 on the piston airliner, 17 levers vs. 50, 45 switches vs. 204, and 42 warning lights vs. 114.

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## moment in history

You are looking at 1/1000 of a second in the history of aviation. It occurred at a fraction past 4:31 p.m. on January 20, 1949.

This was the Zero moment which marked the official launching of the first successful pilotless bomber to be approved by the U.S. Air Force—the Martin B-61 Matador.

The picture is historic for a very significant reason: it records the tradition-shattering payoff of an entirely new development in the aircraft industry, known as Martin Systems Engineering. This is a science and a method of

developing spaceborne systems as total solutions of Operations problems.

The Martin Matador is far more than the thing you glimpse here. Behind it is an integrated network of facilities designed to give this important new weapon simplicity of operation and extreme mobility. These components add up to the total solution of one of the most formidable security problems of our time.

They also add up to one of today's most important developments: the full story of Martin Systems Engineering.

*You will hear more about Martin!*

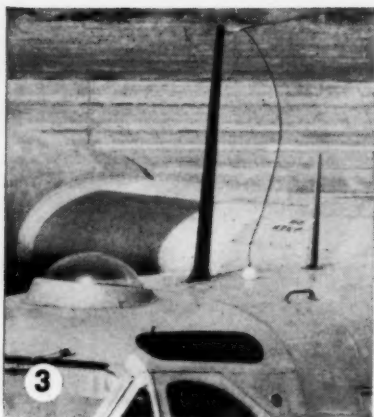
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RESEARCH KEEPS

**B.F. Goodrich**

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## Everywhere the heat's on ice with B. F. Goodrich heated rubber

SUPPLYING ice protection for any size or shape of airplane part is no longer a problem. B. F. Goodrich engineers have developed a flexible electrically heated rubber that fits skin-tight over bulges, around tricky curves and corners.

A core of electric resistance wires running through the rubber supplies intense heat—either in cycles to loosen ice so the airstream can carry it away or constantly, to keep ice from forming. It depends on the particular icing problem. B. F. Goodrich heated rubber can be operated from the plane's regular power supply. It is the most efficient method of putting the right amount of heat on the right spot. It simplifies

design, saves weight, can be cemented onto the part.

Here are some applications—all of different shapes—where BFG heated rubber has given successful ice protection:

1. *On propellers*, it prevents ice from reducing propeller efficiency and cutting down plane speed.
2. *On ruddervators*, it permits accurate control of Flying Boom for refueling in flight under icing conditions.
3. *On radio masts*, it keeps ice from forming and causing them to snap off in the wind.
4. *On air scoops*, it insures plentiful air supply for cabin heating systems and for cooling engine accessories.

5. *On elevator horns*, it keeps them from freezing tight, insures easy control.

B. F. Goodrich electrically heated rubber is also used on wings, hydraulic lines, water tanks, spinner domes, jet engine intakes, and many other airplane parts. It's a typical development of BFG's engineering and research for aviation. Other B. F. Goodrich aviation products: tires, wheels, brakes; De-Icers; Avtrim; inflatable seals; fuel cells; Rivnuts; accessories. *The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.*

**B.F. Goodrich**

FIRST IN RUBBER

AMERICAN AVIATION



## The growing swarm of INTERNATIONAL BARRIERS



## Upheavals in International Lines Ahead

**Supreme Court ruling in Delta-C&S offset case and AA's Mexican exemption fight foreshadow stormy year.**

By WILLIAM V. HENZLEY

**PROBLEMS** affecting U.S. international airline services have mounted to such a degree in recent weeks that a re-shaping of many of our flag airline routes is a distinct possibility. Foremost among the areas involved: Mexico, Brazil, Latin America generally, and India.

But U.S. court cases, political developments, and other causes also subject the stability of U.S. airline services over the Atlantic and Pacific Oceans and north to Canada to varying degrees of challenge. In fact, name the area

and you've got a question mark for some American airline operator.

Most serious at the moment from the broad point of view is the Supreme Court's unanimous and apparently irreversible ruling earlier this month on the all-important "offset" issue. The Court found that CAB should reverse its established policy and require airlines to use excess domestic profits against international subsidy needs.

Excess profits are those over a given rate of return on investment, usually seven or eight per cent for domestic operations. In the case decided by the Court, involving Chicago & Southern

Air Lines (prior to the Delta merger), it was found that \$654,000 realized by C & S for domestic services (1948-50) over and above a 7.4% return should have been applied to reduce C & S's subsidy needs for its international route.

CAB, under its established policy, had permitted C&S to retain the money, considering the domestic and international operations as completely separate for mail rate purposes. The Post Office objected, won a 2-1 vote in the U. S. Court of Appeals last May, and the 9-0 Supreme Court vote this month.

Affected, in addition to Delta-C&S, are Braniff, Northwest, TWA, and to some extent, Colonial, all of which operate both domestic and international routes. Carriers whose international seg-

ments are considered "stub-end" routes and, theoretically, part of their domestic systems for rate purposes, such as American to Mexico, National to Havana, etc., are not directly concerned.

What the affected carriers face is a government policy eliminating the dividing line between domestic and international services. Some or all are not entirely likely to continue their international routes. There could be some route sales, transfers, or mergers in the very near future. In other cases, as international operators began to drain off domestic profits, the sale of international routes to wholly international carriers could well materialize.

It is ironical that chiefly responsible for the new policy is the Post Office Department, which no longer has the responsibility for airline subsidies. Further irony is that CAB does not believe in the offset theory, has fought against it, but is now forced to apply it.

Another court case also has serious implications for international routes, although not on as broad a scale as the offset case. This is the recently filed antitrust suit involving Pan American, W. R. Grace & Co., and their jointly owned airline, Panagra.

Brought by Attorney General Herbert Brownell in a New York Federal Court, the suit could go in any number of directions. First PAA and Grace could win it, in which case their present 50-50 management of Panagra would be preserved. Or the court could direct either PAA or Grace, or both, to divest their holdings in Panagra, as the Justice suit proposes.

Thus either PAA could wind up with Panagra or Grace could, or some other airline such as Braniff, Eastern, National, or Delta could. The case is expected to consume several years, however, barring a voluntary corporate change in the meantime.

The Mexican situation, long a delicate and thorny problem, is alive currently with an internal U.S. fight over CAB's recent 3-2 decision giving American Airlines an exemption to omit Dallas and thereby operate nonstop between New York and Mexico City.

Reason for the exemption was to permit American to compete with a foreign carrier—Air France—which on January 26, 1954, started selling local New York-Mexico City tickets on a nonstop basis. But the method of granting the award to American (CAB action without notice to other carriers) drew fire from Eastern and Pan American and is now in the U.S. Court of Appeals in Washington, D. C.

From American's standpoint, the CAB exemption was necessary because

Fifth Freedom rights inherent in our bilateral agreements with other countries had resulted in the first of what could be several instances where foreign lines wind up with authorizations greater than those of U.S. carriers.

Eastern and Pan Am, meanwhile, participate in New York-Mexico City business through a combination service via Houston or Brownsville. They objected to what they termed was "one of the longest and most important new route authorizations in the history of the CAB" being granted through an exemption.

The over-all Mexican situation, of course, exists through the absence of a bilateral air agreement between Mexico and the U.S. Inability to negotiate such an agreement over the past few years has held up certificates issued by CAB in 1946 to Western, Braniff, and Eastern for U.S.-Mexico operations.

President Truman, in 1952, "withdrew his approval" of the three inactive U.S.-Mexico certificates in a move the legality of which is now being studied by the Department of Justice.

### Problem in Brazil

Meanwhile, there is the Brazilian "situation." It threatens Braniff's Lima-Rio de Janeiro operation, although Braniff, Pan American, and Delta-C&S are currently being considered for a "replacement" route in a CAB proceeding.

Here is that picture. The eight-year-old U.S.-Brazil bilateral provided for a U.S. carrier to operate Lima-Rio on a temporary basis only until a cut-off route to Rio via Manaus and the Brazilian jungle was opened to international traffic.

Under that agreement, the U.S. designated Braniff for the temporary route. Now, reports from Brazil are that the Manaus route will soon be opened, thus raising the question of which U.S. carrier will be designated to operate to Rio on a permanent basis. For years, Braniff, PAA, and Delta-C&S have had applications pending for the jungle route and CAB has started a proceeding to select the carrier.

While Braniff could conceivably lose its Rio route, it should be noted that its segment from Lima to Buenos Aires would not be disturbed.

Reports indicate the Manaus route will be opened by the Brazilian government "in a few months." The CAB case, however, threatens to extend for a much longer period. What will happen if Brazil says the route is open and there is no U.S. carrier yet designated is not known.

From India, meanwhile, comes the announcement that the Indian govern-

ment has given the U.S. necessary year notice that it is terminating the bilateral existing between the two countries. Obviously, U.S. sources indicate, efforts will be made to arrive at a new agreement before the year expires.

But concessions that appear at the time to be necessary to acquire Indian agreement rule out prospects of an easy solution. Affected are Pan American's service to New Delhi and Calcutta and TWA's operation to Bombay. If a new agreement is not drawn up in one year, such operations could be cancelled by the Indians or allowed to continue on terms set out by India.

Major point of issue is the desire of India to revise the U.S. agreement as it has agreements with other countries, to contain a provision empowering India to regulate capacity and frequency of U.S. airlines' services.

Thus Mexico, Brazil, and India are the three nations with which the U.S. is involved in serious and immediate problems. Canada, although relations are on a much more amicable basis than they were two months ago, could be a question mark in the near future when discussions on trans-border routes open.

More imminent are CAB decisions on services in the Atlantic and Pacific areas. In the former, the outlook for certification of an all-cargo trans-Atlantic service this year appears bright on the strength of a CAB examiner's recommending Seaboard & Western Airlines for such a route.

In the Pacific, temporary routes of Pan Am and Northwest are up for renewal and a CAB examiner's recommendation is due momentarily.

In the Alaskan area, hearings in a major proceeding are now under way to determine the network of routes that will exist between the U.S. and Alaska, and within Alaska.

Even Bermuda cannot be overlooked, for if the Eastern-Colonial merger is approved, Eastern will enter the New York-Bermuda market. • • •

### USAF Completes Studies Of Five Aircraft Firms

Studies of five industry firms' techniques of production have been completed by private management consulting companies under USAF contracts and the results are now being studied by Assistant AF Secretary Roger Lewis to determine how costs can be reduced.

Companies analyzed included Republic, Northrop, Consolidated Vultee, Wright Aeronautical, and Allison.

One of the aims of the studies, it is understood, involved the wider use of incentive contracts.

## Vertical Take-Off Fighters Due for Navy

Lockheed Aircraft Corp. and Consolidated Vultee Aircraft Corp. have each built an experimental vertical take-off fighter for the Navy, it has been learned, and the Lockheed craft has already flown.

The two planes, both powered by turboprop engines, are designed to operate from surface vessels, including merchant ships, to ward off enemy air attacks. They take off with the aid of catapult bottles, almost straight up, and are reportedly capable of landing without any approach, i.e., much like a conventional plane.

## Cutbacks Hit B-57's, F-84F's, and J65 Engines

Recent Air Force cutbacks have canceled orders for 33 Martin B-57's a substantial number of Republic F-84F's, and Wright J65 turbojet engines which are used to power both aircraft types. Eliminated orders for the F-84F Thunderstreaks, however, are being replaced by a sizeable new AF order for North American F-100 Super Sabres.

Reduced production of the B-57 night intruder, version of the British Canberra light bomber, was a result of the recently announced revision of the number of wings to be obtained by the AF, officials said.

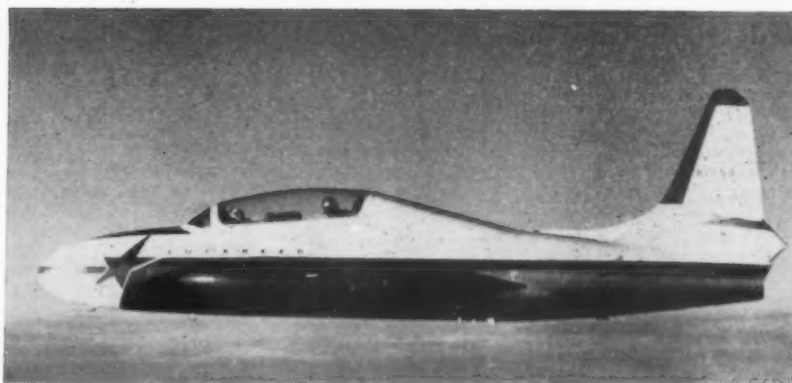
Decision to reduce Thunderstreak production was due to major delays in their production because of "both engine and airframe difficulties," it was added. AF officials explained that the delays moved the program back to such a degree that the later F-100, fastest plane presently in production, could be substituted for the latter part of the F-84F program.

The increased number of Super Sabres virtually doubles AF orders for this fighter, it is reported.

## Name Donald Quarles ANDB Chairman

Donald A. Quarles, assistant defense secretary (research and development), has been named chairman and Defense member of the rejuvenated Air Navigation Development Board. Other members include:

Robert B. Murray, Jr., under secretary for transportation; James N. Davis, special assistant (research and development) to the Army under secretary; James H. Smith, Jr., assistant secretary of the Navy for air; and Trevor Gardner, AF special assistant for research and development.



**New jet trainer, Lockheed T-33B**, will be demonstrated to USAF and Navy during tour of air bases late this month. Slats on leading edge of wing, designed to permit stalls in safety, move in coordination with the air speed and angle of attack. Speed is reported as 600 mph.

## Damon Predicts Higher Revenues in 1954

A probable increase in 1954 airline revenues was forecast by TWA president Ralph S. Damon in a recent address to the National Federation of Financial Analysts Societies in New York. But the prospect for higher net earnings, Damon said, "is not so clear."

Domestically, Damon's "guess" for the industry was a 10% gain in passenger-miles, 7% in revenue, no appreciable change in expense per available ton-mile, and a payload factor of 55%. Within three to five years, the official

said, mass travel will account for 80% of total passenger revenues.

Internationally, "industry revenues will increase equally in line with domestic, but there will be hardly more than a break-even shown on net results in the aggregate" unless a realistic approach is taken to establish a more logical mail rate structure.

Damon said TWA's net worth had improved from \$8 million (or \$4.20 per share) in 1948 to \$57 million (or \$17 per share) as of last November.

## Cal Central Bankrupt

A voluntary bankruptcy petition was filed in Los Angeles Federal Court early this month by California Central Airlines, an intrastate carrier prominent in the Los Angeles-San Francisco coach market.

The carrier intends to continue operations, however, as a "debtor in possession." Col. C. C. Sherman, president, said the company's creditors have agreed to the action, which is connected with a \$1.5 million financing plan. Sherman said he hopes to "work out" of present difficulties in six months.

## Supersonic NACA Tunnel

First of the NACA's supersonic wind tunnels included in the organization's "Unitary Wind Tunnel Plan" will be in operation before the end of the year, according to the group's annual report. A total of \$253 million was authorized for transonic and supersonic

research facilities when the plan was adopted as Public Law 415 in October, 1945.

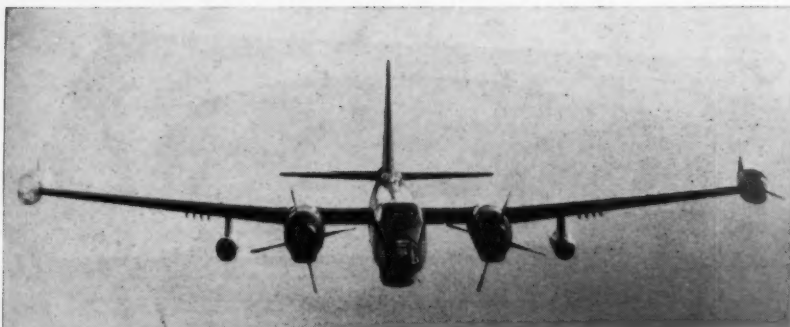
## Only Eight AF C-54's Now Leased by Carriers

Only eight of the original 37 leased Air Force C-54 transports are now being rented to commercial carriers, it has been learned. Air carriers leasing the planes include Trans World Airlines, 2; Overseas National, 4; Viking Airlines, 1; and Great Lakes Airlines, 1.

The total number of AF C-46 aircraft leased to both scheduled and non-scheduled airlines has been reduced to 68 from a one-time high of 106 planes on rental.

Additional returns of both C-54's and C-46's to the AF are anticipated due to the present drop in domestic military traffic with a Korean armistice and also because of increased AF rental fees.





**Jets for Neptune.** Westinghouse J34 jet pods slung beneath the wings boost the performance of Lockheed's P2V-7 Neptune, now revealed to be in production at Burbank. The 36-ton anti-submarine aircraft also has new 32W Turbo-Compound engines, shown feathered in the photo above. The P2V-7 also incorporates an elongated tail housing electronic gear.

## Wilson Asks Standard Depreciation Policies

Defense Secretary Charles E. Wilson has asked the three service secretaries to prepare recommendations on a new policy to govern cost depreciation allowances on machine tools and other aircraft industry equipment which becomes obsolete rapidly.

The industry has been fighting for such a change for several years, pointing out that aircraft tools and facilities become useless much sooner than similar equipment in other industries.

In the past the various services have had different policies on depreciation, often creating situations where one aircraft company producing for both the Navy and USAF found itself with different rates for writing off the cost of tooling. Wilson's request is expected to result in a single policy for the services.

## Curtiss-Wright Offers To Produce Titanium

The Curtiss-Wright Corp. has proposed to the USAF that C-W enter the titanium industry, melting and extruding 500 tons of titanium a month at its Buffalo plant, if the Air Force provides the necessary equipment.

C-W president Roy T. Hurley, testifying before a Senate Strategic Materials subcommittee, said his firm would be able to reach that capacity in about 2½ years. He added he had some definite ideas on how to bring down the cost of the lightweight metal, including a technique for re-refining scrap. Titanium is now running about \$15 a pound for the finished product.

Meanwhile, Defense Mobilizer Arthur Fleming has created a special ODM group to determine long-range titanium needs and set up a timetable for production. Currently authorized

goal is 25,000 tons capacity by 1956. The committee will be headed by Dr. Herbert H. Kellogg, chairman of Columbia University's Engineering School.

In another development, Maj. Gen. Kern D. Metzger, head of the Aircraft Production Resources Agency at Dayton, has written aircraft firms urging them to place orders for titanium in the very near future or else producers might cut their output.

## LA Opposes State Dept. Polar Route Stand

Strong criticism of the State Department has come from the Los Angeles Chamber of Commerce, which urges the reopening of existing bilateral air agreements with foreign governments involving the Pacific area to allow the inclusion of Los Angeles as a co-terminal point on the West Coast.

The LA group is particularly concerned about the State Department's insistence that the Scandinavian Airlines System polar route terminate at Seattle rather than Los Angeles. Official State Department reason for restricting SAS to Seattle is "to protect U. S. carriers." The LA body points out, however, that "since . . . air transport agreements involve reciprocal rights . . . if we force secondary terminal points on (foreign countries) they would undoubtedly be inclined to require our airlines to restrict their operations to similar points in their countries."

SAS president Per A. Norlin has commented: "I think the State Department has forgotten that SAS represents three nations, and that SAS today is only utilizing one terminal point in the U. S. (New York) when at the same time PAA is using three terminal points in Scandinavia (Oslo, Stockholm, and Copenhagen)."

## News Briefs

### MANUFACTURING

Cessna expects a contract soon for the production engineering and tooling of its T-37 jet trainer, according to Dwane L. Wallace, president. Production of three prototypes is reported to be on schedule.

The Douglas Aircraft Co. has ordered a Bell 47G helicopter to add to its fleet of utility aircraft. It will be equipped with floats and with fittings for a life raft. Main function will be the provision of protection for helicopter pilots operating over the ocean near Los Angeles and Santa Monica.

First Bell HSL-1 anti-submarine helicopter has been delivered to the Navy. The tandem rotorcraft is currently at Eglin AFB, Fla., undergoing climatic tests.

### AIRLINES

Pioneer Air Lines has been granted exemption by the CAB to lease Martin 2-0-2's from its new subsidiary, Pioneer Aeronautical Services, Inc., to which the airline transferred ownership of the aircraft when it reconverted to DC-3's.

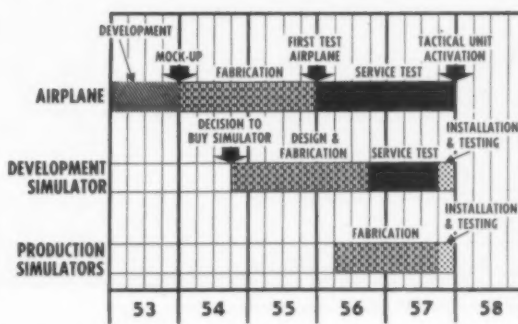
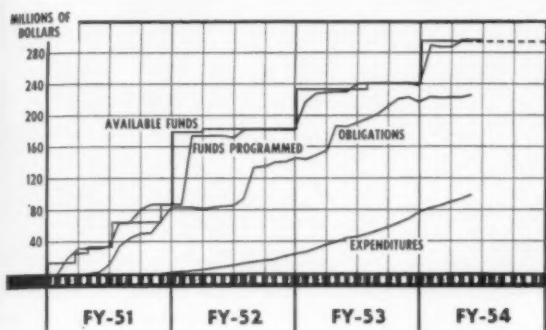
Greater governmental encouragement of tourism has been urged in the report from the President's Commission on Foreign Economic Policy (the so-called Randall report). Among measures suggested were the facilitating of passport and visa issuance, collaboration with foreign governments on ease of entry and accommodations, and a duty-free allowance increase from \$500 to \$1000.

Lockheed's estimate that air freight ton-miles will surpass passenger traffic by 1960 is not over-optimistic, in the opinion of Ralph S. Damon, president of TWA. "Since 1947 . . . TWA's international air cargo volume alone has increased nearly 1000%," added Damon.

Pan Am's first experiment with two-class service on the same plane in the Pacific area will begin February 16 between Portland-Seattle and Honolulu. Standard fare service on the Strato-cruiser will be referred to as "President" service.



## The Simulator Production Picture



AIR FORCE SIMULATOR PROGRAM is currently at \$300 million level, though expenditures are at \$100 million. Chart at right shows decision to send simulators to squadrons three months before airplanes.

## Simulator Firms Attack Common Problems

Symposium produces plan for organization; funds for research and development in field urged.

By HARRY S. BAER, JR.

**F**LIGHT SIMULATOR manufacturers are forming an organization which will launch a unified attack on common problems in the relatively new industry.

The decision to set up such an association was reached during the recent World-Wide Flight Simulator Symposium staged at the Pentagon under Air Force sponsorship. Purpose of the group is to provide the AF with a clearing house for the exchange of ideas and a focal point for significant matters affecting the electronic flight simulator program.

The initial meeting will be held sometime in March; date and site have not yet been announced.

The idea of establishing the organization was submitted by industry members attending the symposium. It will be a civilian agency and probably limited in membership to companies which have produced flight simulators.

The Pentagon symposium, held on January 19-21, covered all of the current problems affecting the production and use of these ground training devices which reproduce the operation and cockpit design of specific types of aircraft.

Major recommendations submitted at the conference will provide the new industry association with a solid basis for launching its discussions. Important ones included:

- A request for funds for flight simulator research and development;
- Contracting for spares support from industry rather than by using the AF supply system (an AF task group has already been appointed to study this recommendation);
- Need for a better modification program so that engineering change proposals and in-service modifications can be handled expeditiously in order to keep flight simulators current with the aircraft they represent;
- New applications for simulators, such as those for missiles and for ground control of aircraft;
- Quicker delivery of aircraft parts and data from prime aircraft manufacturers to the simulator builders (lack of such service has been charged with slowing up simulator production considerably);
- Treating the support of flight simulators as a "package," to include such items as the power supply, spare parts, housing requirements, air conditioning, tools, testing equipment, and publications.

Contractors at the symposium also recommended that the AF should not force standardization. Although they indicated that standardization was all right for quality controls, specifications, and performance, they emphasized that it should not be applied to the components of flight simulators.

In summarizing the up-to-date status of the AF flight simulator program, Col. Anthony J. Perna (Chief of the

Special Training Devices Division) noted that major AF commands have received delivery on 48 out of 174 flight simulators which have been ordered. The types include the B-50, B-47, B-36, C-97, C-124, C-119, F86D, and F89D.

From here on simulators will be produced so that they will be delivered to Air Force commands three months earlier than the aircraft they simulate so that crewmen will have an edge in familiarizing themselves with the ground trainers and so that they may be set up properly.

Among such types of simulators now being built are the F-100, F-101, F-102, B-52, RB-66, C-130, and C-121.

"Use of simulators by our commands has varied from excellent to outstanding," Perna pointed out. "Initial air transition time has been reduced and proficiency flying minimized. This means more air time is available for combat training and the quality of the crew member has improved. Accident prevention and scientific crew evaluation have both been improved through use of simulators."

Perhaps the most complex piece of military operational equipment, the simulator, the AF has learned, can be run and maintained at a tenth of the cost of an aircraft.

Some problems encountered in the field include (1) lack of a current equipment components list which will authorize adequate test equipment and tools; (2) short life and lack of readily available replacement parts for radio navigational equipment; (3) non-availability of applicable handbooks, parts catalogs, and technical orders. • • •



**AIR LAUNCHING** shows Firebee drone target dropping from bomber, which quickly pulls up and away.



**GROUND LAUNCHING** shows Firebee taking off from ramp with smoke from rocket assist billowing behind.

## The Firebee Tries its Wings for the USAF

**T**HE Air Force's need for an economical high-speed target to supplement present drones has brought about hurried development of the Ryan Firebee, which already is essentially operational.

A product of the Ryan Aeronautical Co., San Diego, Calif., this pilotless jet target drone is now in the "proof of the pudding" stage, otherwise known as operational suitability testing, at Holloman Air Development Center, N. M. Powered by a Fairchild J44 turbojet of 1000 lbs. thrust, the Firebee had recently added to its red fuselage's air intakes, via an imaginative paint brush, a reasonable facsimile of a tiger's mouth—an indicative trademark of the new phase of the Firebee program.

Launched from the ground or the air, the jet targets most recently have become airborne on the wing of a

Douglas B-26. In this wing-launch method, the target drones are cradled in specially designed wing racks mounted at each of the outboard wing bomb shackles. Release of the Firebee in flight is done by the electric bomb salvo switch. Two launchings are accomplished on each B-26 mission.

After the Firebee dropaway, the drone is controlled from a ground station where data is recorded on the target's performance. When the fuel is used up, the Firebee is parachuted to the ground, and it will again be used in a similar operation. Should the Firebee go out of control, an automatic parachute recovery system goes into action.

This phase in the Firebee program is being conducted at Holloman by the AF Operational Test Center of the Air Proving Ground Command, Eglin AFB, Fla. A small building at the New Mexico base houses the colorfully decorated

Firebees in all stages of assembly and disassembly. For all practical purposes, the unit can be considered the vanguard of future operational Firebee squadrons.

In addition to the suitability testing, comprehensive data is being compiled to determine requirements for properly staffing, equipping, and supplying an operational Firebee squadron. This information includes facts on personnel and equipment requirements, maintenance requirements, range requirements, spare parts needed for sustained flights, mobility of support equipment, endurance of the target at all altitudes, maximum altitude attainable, and attrition of targets.

On successful completion of the Firebee suitability testing program, this information will be made available to operational Firebee squadrons. • • •



**READY TO GO**, a B-26 waits while its twin launching racks, with Ryan Firebee drones slung beneath, are given a last minute inspection before air launching.

# VICKERS VISCOUNT FACTS *that count*

Within six months of its introduction, British European Airways announced the following figures for their Vickers Viscount operations:

|                              |                       |
|------------------------------|-----------------------|
| <b>Total revenue earned</b>  | <b>\$3,920,000.00</b> |
| <b>Total costs incurred*</b> | <b>\$2,814,000.00</b> |
| <b>Total profit earned</b>   | <b>\$1,106,000.00</b> |

BREAK - EVEN LOAD  
FACTOR FOR FIRST  
SIX MONTHS TO  
COVER ALL COSTS:

**51%**

BREAK - EVEN LOAD  
FACTOR FOR FIRST  
SIX MONTHS TO  
COVER DIRECT OPER-  
ATING COSTS:

**28.1%**

\*BRITISH EUROPEAN  
AIRWAYS TOTAL  
COSTS INCLUDE ALL  
OVERHEADS AND IN-  
TEREST ON CAPITAL.

For a total of 6,140 revenue hours this adds up to a profit of

**\$179.20 PER FLYING HOUR**

(Conversion from Sterling to dollars, \$2.80 to £)

Moreover this was achieved in the early months of the Viscount's operational service, when the utilisation was still at the low annual figure of 1560 hours.

**VICKERS  
VISCOUNT**

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**On order in North America for Trans-Canada Air Lines**

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# Interview

With

## Warren Lee Pierson

Board Chairman

Trans World Airlines

...

## International Service Today and Tomorrow

...

**Warren Lee Pierson** has served as chairman of the board of Trans World Airlines since 1947. In 1950, he served as president of the International Air Transport Association. Considered an expert in international finance and law, Pierson until recently served as U. S. representative on the Tripartite Commission on German debts, with the rank of Ambassador. He received the appointment in June, 1951.

Pierson began government service in 1933, serving as special counsel for the RFC. In 1934, he was named general counsel for the Export-Import Bank and helped prepare the original articles of incorporation. He served as president of the bank from 1936 to 1946. During this period, he was called in as financial adviser to the U. S. delegation at the Bretton Woods Monetary Conference in 1944.

He was a member of the Inter-American Financial and Economic Advisory Committee from 1940 to 1945 and, in 1945, became an adviser to the Inter-American Conference on Problems of War and Peace at Mexico City. Just prior to joining TWA, he was president of the American Cable and Radio Corp.

Pierson was born in Princeton, Minn., in 1896, receiving his AB degree from the University of California and his law degree from Harvard Law School in 1922. He began private practice at that time in Los Angeles and continued it until 1933.

Pierson's decorations include Officer, Legion d'Honneur (France); Order of the White Rose (Finland); Comendador, Orden Cruzeiro do Sul (Brazil); Orden Mexicana del Aguila Azteca (Mexico); and the Star of Italian Solidarity.

### Q. What are the big problems today in international airline operations?

A. The general delays that the U. S. flag airlines experience in obtaining decisions from the Civil Aeronautics Board, such as getting their permanent mail rates determined. All serious delays give an instability to the operation of an airline, international or domestic. Also, delayed or unwise decisions by our government may have repercussions on governments abroad.

### Q. Do you feel that the industry today is in a healthy state?

A. Certainly today the industry can be said to be in a healthy state; the companies generally are solvent, and business as a whole is good. The trouble is a lack of stability. The lack of stability again arises from the fact that there seems to be no set Government policy with respect to the airlines.

We have had our ups and downs, and while we are all right as of today, we are faced with very important decisions, largely as a result of the technological developments in the industry. It is exceedingly important, to my mind, that airlines should be given a breathing spell and permitted to make some money, in order to put themselves in a position to pay for expensive new equipment.

### Q. Do you think that the industry is now receiving an adequate return on its investment?

A. I don't think it is making an adequate return. That's quite evident from the appraisal that the market puts on shares of air transport companies. They are actually selling at considerably less than most of them cost five or more years ago.

### Q. On the international side again, what do you think of the Government's international airline policies?

A. I have no complaint with the policy; over the years it has been pretty sound. However, the implementation sometimes has been inconsistent.

### Q. India has denounced its agreement with the United States. Do you see any evidence of that restrictionist theory spreading elsewhere?

A. Frankly I don't. I think the Indian situation is more or less unique. There is a feeling in India that at all costs they must call the turn on the activities of all airlines entering India. The result is, of course, that they write agreements to limit schedules, which is contrary to the policies of our Government.

I should hope that we will be able to prevail and that international aviation will not be throttled by official limitation of schedules.

### Q. How much of your traffic to India and out of India is Fifth Freedom traffic?

A. The thrice-weekly services operated to India when viewed in their entirety—that is, all segments from New York to Bombay—average substantially more than one half Third and Fourth Freedom traffic in terms of passenger-miles. The difficulty we have had is that some of what we regard as Third and Fourth Freedom traffic the Indians call Fifth Freedom traffic. There's a difference of opinion there which becomes important when you are negotiating a bilateral agreement.



## International tourist service in '54: 'Perhaps as high as 80%'

**Q. What is your interpretation of Third and Fourth Freedom traffic?**

A. We feel that any traffic which we have had a hand in generating in the United States—whether it stops over in Paris, Rome, or some other place—is Third and Fourth Freedom traffic, especially if the passengers are American citizens, as most of them are.

**Q. Will most international service in the future be tourist?**

A. Yes. We in TWA are very anxious to forget this word "tourist" that is used so much. We look forward to having two classes: one standard, which we now refer to as tourist, and the other de luxe.

Tourist service is going to increase. I think that next year our tourist travel will be perhaps as high as 80% of the total.

**Q. Is it a good thing economically to have such a large percentage of your available seats in what you call standard service?**

A. It's our experience that the return to the company on the flight is better on what I call the standard flights than it is on the de luxe flights. Of course, you have to bear in mind that there are other considerations. On the de luxe flights, we can carry more mail or more air express or air freight because of the lower passenger load.

**Q. Is domestic travel also 80% standard?**

A. I think the seat-mileage is about 50-50; it may now be a little bit less than that, but as of June it will be about 50-50.

**Q. Do you think that the U. S. flag lines on the Atlantic will continue to carry a substantial percentage of the business?**

A. I think that the U. S. flag lines will continue to carry about what they are carrying now. TWA and Pan American now carry roughly 50% of the trans-Atlantic traffic, and I think that we will continue to keep that ratio.

**Q. How can international trade be promoted through international air transportation?**

A. The aspect I would be inclined to emphasize is the contribution which tourism makes to international trade. That is going to become more and more important.

People are now paying considerable attention to a report put out by the Randall Commission which advocates in effect that we should try to increase imports to the United States by lowering our tariffs. That, of course, is going to meet opposition in some quarters.

There is one kind of import, however, which does not seem to terrify even the protectionists, and that's tourism: Americans spending money abroad, which will inevitably return to the United States. To the extent that that can be increased everybody will be happy.

**Q. The United States Post Office seems to have reduced somewhat the amount of United States mail that is carried by foreign airlines. Apparently some of the foreign governments in return have reduced the amount of their mail that is being given to our airlines.**

A. I think the recent attitude of the Post Office in limiting or reducing the amount of mail it sends by foreign carriers in order to reduce its costs is unfortunate, and I don't believe it is in the best interests of the United States as a whole.

It will, of course, slightly reduce the bill to the Post Office, but in the end it will cost the taxpayer in the United

States more. Less revenue for foreign mail will inevitably increase the amount which will have to be paid as subsidies to the U. S. airlines.

**Q. What do you think of the present level of the UPU air mail rates?**

A. If the governments which make up the UPU, which means practically all the governments of the world, can settle on a rate as being compensatory, that should satisfy the United States and should satisfy our airlines.

Certainly at the moment we feel that the present UPU rate is a proper compensatory rate. We feel that inasmuch as it's approved by other governments who have given the matter study, it would be a forward step if it were accepted by our own government.

I think the 85¢ CAB rate is too low as compared with the \$1.89 or \$1.90 rate of the UPU. It gives no consideration to the value of the services; it is based entirely on the cost of the service. We don't think that's good rate making.

**Q. Has TWA suffered any losses since Pan American began service between Paris and Rome?**

A. Theoretically, no, because when they were admitted to Paris and Rome we were given the rights to serve London and Frankfurt. However, they were allowed to close the gap between Frankfurt and Zurich.

### Spain Will Develop

**Q. Do you anticipate growth in your business with Spain as a result of the development of the U. S. military base program?**

A. Business over our line will develop very substantially, we think. We will add schedules next summer. Spain will develop primarily not only because of the increased activity of the United States in Spain, but because eventually we hope to have more Spanish traffic due to improved economic conditions in Spain.

**Q. Do you think that IATA is doing a good job for the airlines? In what way could it improve the service it is rendering to the airlines?**

A. I think IATA is doing a particularly good thing in policing its members; it is becoming more and more active in this field. It provides a forum where officials of international airlines can express their opinions, which they do with exceeding frankness. As a trade organization I think it is serving a very useful purpose.

**Q. What expansion plans, if any, in routes or equipment, are currently in the making for TWA?**

A. Our only major international route question is awaiting a decision in the Far Eastern Case, which we presented last year.

Domestically we have three major cases: stops at Detroit and Cleveland between Chicago and New York; Denver on the transcontinental route; our application to serve Tulsa and Oklahoma City. The latter has turned, incidentally, into a free-for-all.

On equipment, we have currently on order for delivery within a year 20 Lockheed 1049-E Constellations. That is the only equipment at the moment that we have actually ordered, and for which financial arrangements have been made.

**Q. What is your thinking on jet transports?**

## CAB: 'In danger of being dominated by the staff'

A. We haven't gone beyond studying what is going on in Europe. We are keeping close account of the activities of the de Havilland Company with the Comet. We think that BOAC is doing aviation a great service by pioneering that ship. We haven't ourselves, as you know, ordered any. What we will do with respect to the jets is a matter for the future.

**Q. You mentioned the fact that the airlines should be allowed a breathing spell, as you put it. What specifically does CAB have to do to ensure stability in the industry?**

A. One thing it has to do—the 45¢ mail rate was only reached after a long period of waiting and they have already stressed that that is going to be re-examined. And this is before a final rate is reached in our international mail rate. That doesn't affect all the domestic carriers, but it happens to affect TWA.

We feel that CAB might aid the industry very materially if it would settle these problems and having settled them live with them long enough to see whether they are equitable or not. This way we are in a constant uproar.

The last two years have been fairly good so far as revenues are concerned. But no one is content to leave that alone. They want to question not only the mail rate but there is even talk of investigating the fares charged by airlines.

### 45¢ Is Too Low

**Q. I gather that the Post Office Department has some doubts as to whether 45¢ is really a service rate. Do you believe it is a service rate?**

A. I think it is on the low side for a service rate. I think 45¢ is a reasonable rate only if you admit the thesis that a rate should be based purely on the cost of service and not on the value of service. Considering that air mail has precedence over all other types of traffic, that it receives preferred handling generally, we feel, and I think most rate-making authorities agree, that 45¢ is low.

**Q. What do you think of the rate level that was established for the carriage of first class mail?**

A. That is something that the Post Office wanted to try as an experiment. While we think it is a little too low, if it is accepted simply as a topping-off proposition, using capacity that wouldn't otherwise be utilized, and since we are not obliged to carry the mail if we don't have the capacity, we have no serious quarrel with it.

We are only fearful that it may undermine the volume of air mail carrying a six cent stamp, and may be the camel's nose under the tent to bring down the whole rate structure.

**Q. What do you think of the airlines' business prospects during 1954?**

A. I predicted some time ago in one of the national surveys that our revenues in 1954 will be somewhat higher than they were in 1953 and that our net earnings will probably be a bit lower, largely because we are being squeezed by costs which are higher than they were a year ago.

**Q. Do you believe that international business will hold up better than domestic, or vice versa?**

A. I think our trans-Atlantic business is going to be increased percentage-wise more in 1954 than our domestic. That's due to the fact that this marking time in business domestically does not seem to have much to do with peo-

ple's desire to take a vacation, or on people traveling governmental and other missions abroad.

**Q. The airlines have been and are adding a large number of airplanes and, therefore, available seats to their fleets. Is the business going to be there to fill those seats?**

A. We don't have any problem internationally; we feel that the international seats will be utilized. The local factors may not be as great, but the overall revenue will be larger.

**Q. Do you feel that basically CAB is sound as it is now set up?**

A. I think the concept of the CAB as set forth in the law is an excellent one. Furthermore, it has done much to develop what is the world's best civil aviation system. However, with the passage of years and the increase in volume of work, the Board is in danger of being dominated by the staff.

I believe the members should take a good look at themselves today and be sure that they get back to fundamentals and perform as the quasi-judicial body they were created to be. They have sometimes seemed to be run by a staff which doesn't always appear to have the best interests of aviation or private industry at heart.

**Q. Does TWA contemplate transcontinental nonstop operations in both directions?**

A. Oh yes, we'll have that; we have it now, you know in one direction. We could do it in the other direction but we don't think it is good business at the moment. When we get our Lockheed 1049-E's we will probably go nonstop in both directions.

**Q. A suggestion was made last year by Senator Johnson that the trunk lines take over some of the feeder line points to cut down the subsidy. How about that?**

A. Well, I look forward to a simplification of the route structure in the United States, and by simplification I mean fewer airlines. I think that will accomplish what the Senator has in mind. This will not happen in the immediate future.

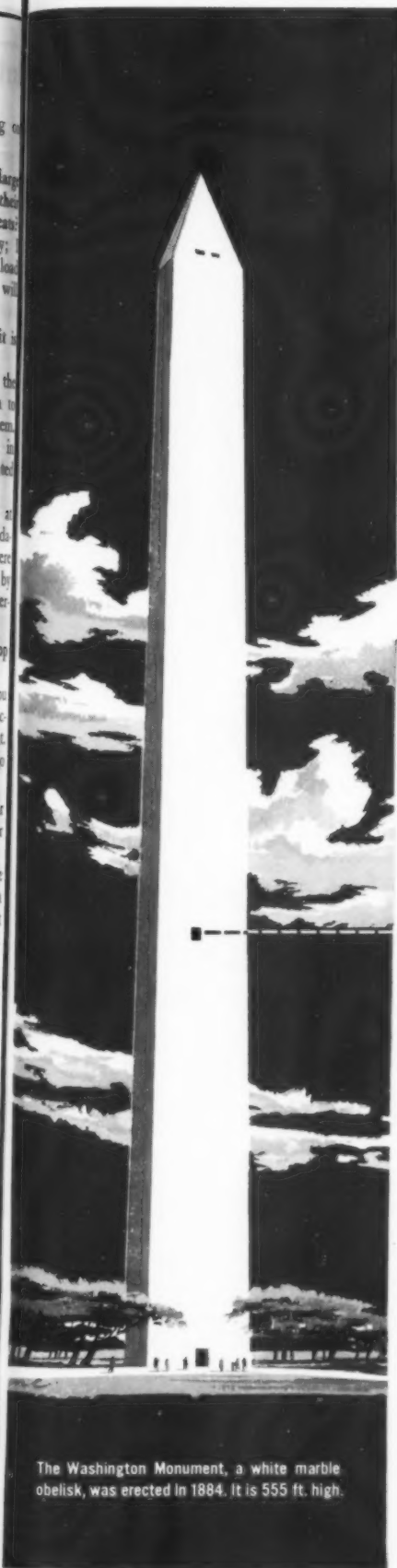
**Q. Is our country, in negotiating aviation matters with foreign countries, utilizing all its bargaining power?**

A. I have been in the Government where industry has come and raised Cain because they said we weren't paying particular attention to them and we were giving foreign governments great benefits without getting anything in return. I have also been on the industry side of the fence, where I have said the same thing to Government representatives: that they were neglecting aviation, notwithstanding the fact that they were handing out largesse in large quantities to the countries that were discriminating against us.

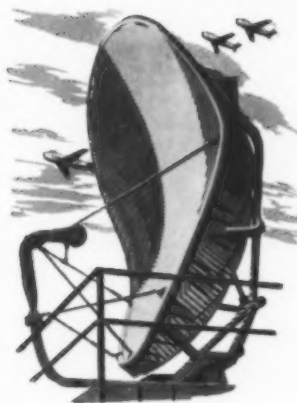
I think that generally our Government representatives should bear in mind the various interests involved, and in their final decision they must settle on what is best for achieving the national political policy, even if it doesn't do everything it should for all the particular interests involved.

**Q. Can Government subsidies be eliminated in the future, and if so what is the major factor which might help?**

A. I doubt very much that it will be possible in the foreseeable future to do away with some kind of subsidy for an international airline. Certainly we will have to have lower costs than I can foresee now to make that possible.



The Washington Monument, a white marble obelisk, was erected in 1884. It is 555 ft. high.



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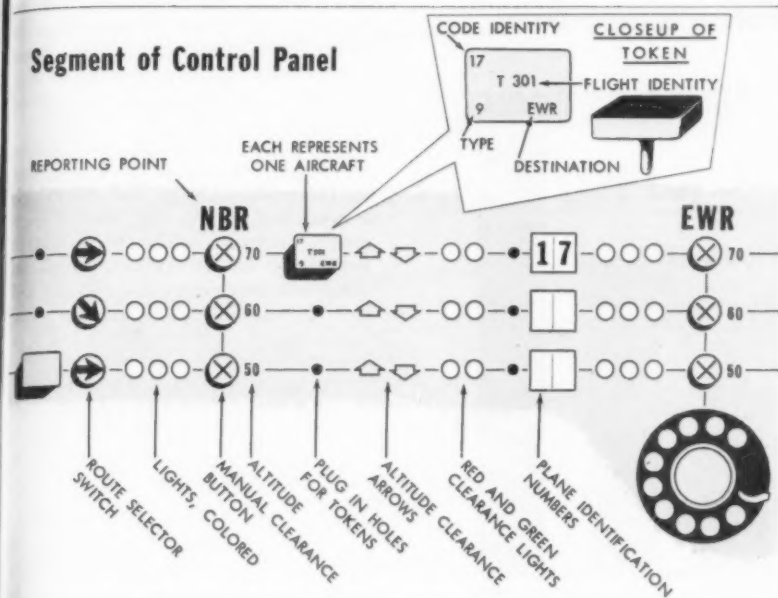
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## Segment of Control Panel



BASIC ELEMENTS of proposed traffic control system. A peg-like token is moved from hole to hole along board to mark each airplane's progress.

## New Traffic Control System Urged

Antiquated methods hamstringing airlines, with other new programs years away, IAS is told.

By JOSEPH S. MURPHY

ONLY A FEW HOURS before CAA Administrator Fred B. Lee was to sound the warning that "some bold moves" must be taken to prepare air traffic control for the 40-million-passenger airline traffic of 1960, the Air Transport Association's S. P. Saint was unveiling what could very well prove to be just that bold move.

What Saint proposed was an automatic traffic control board which would operate on the principle of a railroad-type block signal system. He estimates that it could be fully developed within a year and would serve to cut present ATC workload by as much as 40%.

What is more significant, Saint feels that the system could be placed in operation far ahead of the planned Air Navigation Development Board's so-called "short-term" air traffic control system now scheduled for completed evaluation in December, 1958. Saint's proposal could also be designed to fit into that ultimate system.

The scene of the presentation was the annual meeting of the Institute of the Aeronautical Sciences. Throughout the week-long session, no single point was made more strongly than that of the inadequacy of today's air traffic control system.

But the real highlight of the program was the proposal by Saint of a system that could cure many of these shortcomings soon—not in 1958 or 1960. Although he cautioned that his plan represents an ATA-suggested system, not a stand on the air traffic control issue, he did indicate that it would be submitted to the Air Coordinating Committee soon.

Basic make-up of the new system:

- **Flight control board:** Gives the controller a graphic display of traffic in terms of altitude and location. Vertical lines indicate established fixes, horizontal lines indicate altitudes.

- **Flight identity:** Token plugged into holes in control board would carry flight positions from fix to fix. Writing on token face would include flight number, airplane type, destination, and code number for automatic transfer from one board to another. Speed category of airplane could be indicated by use of tokens with stems of different lengths.

- **Flight direction:** Jack positions to right of a fix would accommodate eastbound flights; those to the left, westbound.

- **Clearance indication:** Flashing lights would warn of vacated flight positions. Combination of up-and-down clearance arrows and red-and-green

warning lights adjacent to token positions would handle straight-through clearances or altitude changes.

- **Route selection:** At points where routes diverge, a selector switch would not permit clearance until specific route was chosen.

- **Manual operation:** Where this is necessary, a lighted button would indicate aircraft under manual control.

- **Separate fix indication:** Warning lights, independent of those showing clearance information, would give the status of traffic over a fix, and the clearance for specific flights.

- **Automatic sequencing:** With aircraft speed and position data continuously available in the system, adaptation to orderly spacing of flights into a landing sequence would become a reality.

- **Controller coordination:** Flight movement between adjacent sectors would permit use of the same token. For non-resident sectors, a use of telephone type dial and special code numbers would transfer a flight from one controller to another.

A recognized authority on air navigation as well as a currently rated airline pilot, ATA's Saint lives with the day-to-day traffic problems and has the system worked out to combat them.

For example, he cites the inability of present manual fix posting of flights (controllers hand-scribble over 8000 in the New York area on a busy day) to combine with radar traffic control. The proposed system is entirely compatible with radar, and would open the door for its wider use in critical areas.

The only real stumbling blocks now in its path are the decision to adopt the system and the allocation of funds for its design and procurement. No new ATC regulations or procedures would be required. Navigational fixes need not be changed. Present traffic separation standards would apply.

The system could bring:

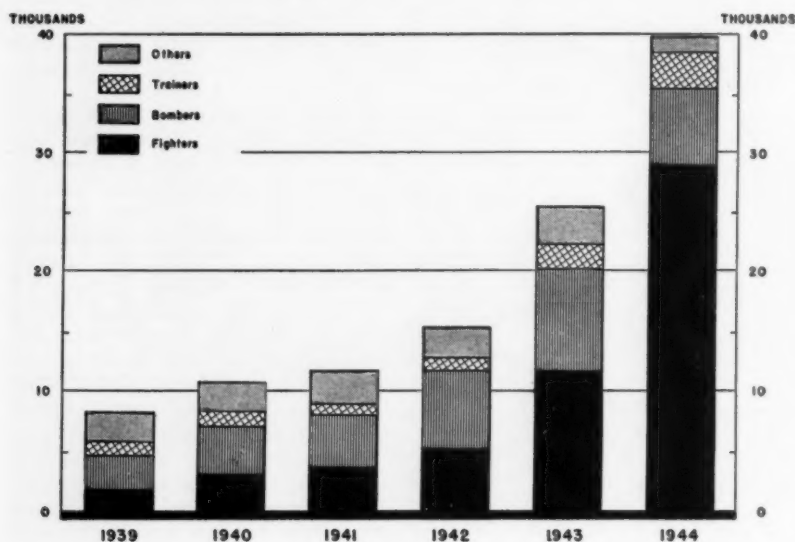
- **Greater flight safety:** Simplified control with greater flexibility, the elimination of burdensome manual transfer of flight data, and adaptability to radar control, all add up to a safer operation.

- **Reduced training:** Controllers would be brought more quickly to the needed level of proficiency.

- **Greater economy:** Overall control workload would be cut up to 40%, with fewer control personnel required.

With the outlook bleak for any other early solution, and the forces of safety and economics in its favor, the new ATA suggestion should attract some serious consideration in the Commerce and Defense Departments. It could bring on the "bold move" that would solve one of aviation's biggest problems. • • •

## How Germany's Aircraft Industry Grew



EXPANSION of German aircraft manufacturing industry is shown in chart above. Fighters absorbed greatest amount of production during war.

## Germany: Strong Ally, Strong Competitor

Some 26 aircraft plants with a labor force close to 26,000 may soon swing back into production.

By ANTHONY VANDYK

ALTHOUGH it is generally admitted that the amazing postwar development of the Soviet aircraft industry would not have been possible without the use of German brains and equipment, there is a lack of recognition among the Western Allies of the advantages to be derived from the use of Western Germany's aircraft industry potential.

Today, almost nine years after the defeat of Germany, many people seem to have forgotten that many of the resources of what was once continental Europe's mightiest aircraft industry can play a valuable part in the defense of the West.

Germany is still prohibited from engaging in aircraft production but, with the feeling growing that this restriction is unlikely to be maintained much longer, several U. S. firms (including Curtiss-Wright, Lockheed, and United Aircraft) have been surveying the potential of Western Germany's aircraft industry.

These companies realize that Germany's stabilized condition, its relatively low wage levels, and its abundant hard-working skilled labor force make

it a valuable ally but a dangerous competitor.

They are also aware that German brains are particularly skilled in aviation matters, recalling German "firsts" in such fields as jets, rockets, and guided missiles. Numerous leading German designers and technicians have been working in countries of the West for several years but many more have given their services, usually involuntarily, to the Soviet aircraft industry.

The ability of Germany's aircraft industry to rise from the dust is not in doubt, since it successfully did just that some 20 years ago.

In 1931 Germany's total output was 13 planes, and in the following year it was only three times that number. With Hitler's assumption of power in 1933, there came a rapid expansion: from 368 aircraft built that year annual output increased to 5112 planes in 1936. During 1937 a number of new, specially built factories were completed and by 1938 the main structure of the German wartime aircraft industry was completed. In 1939 the industry produced 8295 planes and by 1944—despite heavy bombing attacks—the figure was 39,807.

Peace found the major components

of the German aircraft industry in the Soviet occupied zone. Blueprints, equipment, prototypes—and even entire plants—were moved to Russia and large numbers of technicians moved eastward too.

In the western zones of Germany dismantling proceeded apace and some of the equipment in the plants was shipped to Russia as reparations. Nevertheless, the basic elements of the aircraft industry in Western Germany remained intact. Certain financial problems still have to be resolved (AMERICAN AVIATION, June 8, 1953) but essentially the industry is ready to roll again.

It should not be thought, however, that big transports and bombers will start coming off the lines as soon as Germany is legally permitted to re-enter the aircraft field.

### Too Close to Russia?

Many Western German aircraft men believe that it might be foolish to establish major aircraft production facilities so near to the Iron Curtain. They consider that the best initial role for the industry would be such fields as component production and research. They would prefer to let the growth of the aircraft industry use spare production facilities and workers rather than replace non-aviation activities developed after the war.

A recent survey by AMERICAN AVIATION shows that whatever is to be their role, there are available about 26 aircraft plants proper with a total area of some 3,300,000 square feet in Western Germany today. A skilled labor force of about 26,000 could be put to work within a short time and the factories could be put back into aircraft production without excessive expenditure.

Although many of the plants are currently producing non-aviation mechanical equipment, the managements and workers are mostly those who were there when aircraft were being produced.

Former aircraft component and accessory manufacturers (apart from automobile, electrical and radio concerns) in Western Germany have over 20 plants with a total area of some 2,700,000 square feet; about half of this production space could be used for the assembly and manufacture of fairly large components, and at least two of these factories could be used for airframe production if required. A labor force of 12,000 for these plants could be assembled quickly.

The Western German potential is impressive when it is realized that only a few of the main German aircraft companies had their main plants in what is now the Western Zone; those companies are Blohm & Voss, Focke Wulf,

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Henschel, Messerschmitt, and Weser.

The chief factories of Arado, Siebel, Heinkel, Junkers and Gotha are all in the Soviet Zone, although the first three have their head offices in Western Germany. Moreover, all of Germany's major engine plants (BMW, Daimler-Benz, and Junkers) are in the Soviet Zone.

Several of the major plants in the Soviet Zone of Germany have been rebuilt. These include the huge Junkers engine and aircraft factories at Dessau, which are the main centers of the re-viving aircraft industry in the Eastern Zone. A Junkers company has been formed in Western Germany and its

projects include the manufacture of diesel engines, a Junkers specialty.

Junkers, incidentally, had a labor force of 157,000 at the end of the war and was the largest company in the German aircraft industry. Other plants in Eastern Germany which have been rebuilt include the Gotha factory, the BMW engine plant at Eisenach, and the Daimler-Benz engine factory at Genshagen.

The accompanying report would not be complete without mention of the two great engine manufacturers, BMW and Daimler-Benz. The former's main plant is at Eisenach in the Soviet Zone but the company maintains an office in Western Germany at 76 Lerchenauerstrasse, Munich 13. Daimler-Benz has one plant in Western Germany, at Unterturkenheim, but this currently manufactures truck engines.

In addition to the big aircraft and engine companies there are about eight firms in Western Germany which are currently producing sailplanes. More important, however, are the numerous former component and accessory manufacturing companies which greatly increase the German aircraft potential.

Among these is Luther & Jordan, with plants at Brunswick, Helmstedt, Goslar and Trier. This concern has built complete aircraft under license. Another major company still in existence and ready to return to the aircraft field is Bachmann, von Blumenthal & Co., which has its offices and plant at Furth; this concern used to repair Junkers, Messerschmitt and Dornier aircraft.

Optical equipment for the aviation industry of Western Germany could be supplied by Friesack & Hopfer GmbH of Erlangen-Bruck, whereas parachutes could be furnished from the resources of Vereinigte Fallschirmbau GmbH, located at 133 Bockenheimer Landstrasser, Frankfurt.

Finally mention should be made of the following subcontractors, now busy with non-aviation work, which could again supply components and machine tools for the aircraft industry:

Comba GmbH (formerly Brickmann & Mergel), located at Hamburg-Harburg; Faudi Feinbau GmbH, Frankfurt-Oberursel; Kaether & Co. GmbH, Krefeld; Theodor Klatte, Bremen-Huchting and Weener; Gustav Rafflenbeul Maschinenfabrik, Schwelm; Wilhelm Schultze, Stuttgart; Wilhelm Schmidding, Cologne and Hanover; Otto Schuler GmbH, Kiel; Von Stein & Weiss, Dusseldorf; Spinnbau Farge, Farge, SUDAK Sueddeutscher Apparatebau Koppenburg, Karlsruhe; and VEMAG Verdener Maschinen-und Apparatebau GmbH, Verden a.d. Aller.

## Where Germany Stands Today

*The survey below shows the precise status of Germany's aircraft companies:*

• **Arado-Flugzeugwerke GmbH** (address: 15 Schumannstrasse, Bonn). All seven plants are in the Soviet Zone. The present company was formed in Bonn last year and has no facilities of its own. Arado's chief designer, Professor Blume, works in the city of Duisburg, Western Germany. Arado originally designed and built single-engine planes. During the war it produced other companies' aircraft under license and also worked on four-engine transport and bomber planes of its own design.

• **Blohm & Voess** (Hamburg) has three plants and 5000 workers available for allocation to aircraft manufacture. Company specialized in flying boats.

• **Dornier-Werke GmbH** (Friedrichshafen-Manzell) lost only one of its plants (Wismar) to the Soviet Zone. Its three factories in the Western Zone could easily be reconverted to aircraft work. A Dornier design staff currently has offices in Spain. Company built various types of aircraft, but is best known for its giant Do-X flying boat and its Do-17/217 bomber.

• **Focke - Flugzeugbau-Forderungs-GmbH** (Wilhelmshaven-Mariensiel). The Focke factory at Wilhelmshaven is currently used by another company to make bodies for Ford and Krauss-Maffei vehicles. Professor Focke is now in Brazil designing advanced helicopters and convertiplanes, which he hopes to have built by the Focke company.

• **Focke-Wulf Flugzeugbau GmbH** (1-5 Hunefeldstrasse, Bremen) is currently building sailplanes at its plant on Bremen airport. A subsidiary plant at Bremen-Hemelingen could also be made available. Focke-Wulf's most famous designs were the Fw 190 fighter and the Fw 200 transport/reconnaissance aircraft.

• **Ernst Heinkel AG** (41 Hellmuth-Hirth-Strasse, Stuttgart-Zuffenhausen). Having lost its main plant at Rostok and most of its other facilities in the Soviet (one of its factories has been removed to Kiselevsk in Siberia) Heinkel took over the former Hirth engine plant at Stuttgart-Zuffenhausen and is planning to acquire two other plants. Currently building various automotive products, Heinkel has definite plans to return to the aircraft field. Company gained fame from its He 111 bomber and its pioneering work in the jet field.

• **Henschel Flugmotorenbau GmbH** (Kassel) is a subsidiary of the Henschel locomotive manufacturer. Its plant at Berlin-Schonefeld airport is now in the Soviet Zone, but the Kassel factory, which built Daimler-Benz engines during the war, could be made available

for aircraft production (it is currently building locomotives). Henschel built small twin-engine planes, but much of its fame resulted from its development of simplified manufacturing processes.

• **Junkers Flugzeug-und Motorenwerke GmbH** (15 Schumanstrasse, Bonn). Although most of its facilities are being used to rebuild the East German aircraft industry, the Junkers company has an office in Western Germany and plans to manufacture diesel engines. Several of the top Junkers personnel are in the Western Zone, but hundreds of the company's engineers are still in Russia and many more remain at its headquarters at Dessau in the Soviet Zone of Germany. Junkers' best known products include the Ju 52 transport, Ju 87 dive bomber, and Ju 88 medium bomber. In the powerplant field Junkers was a pioneer of diesel and jet engines.

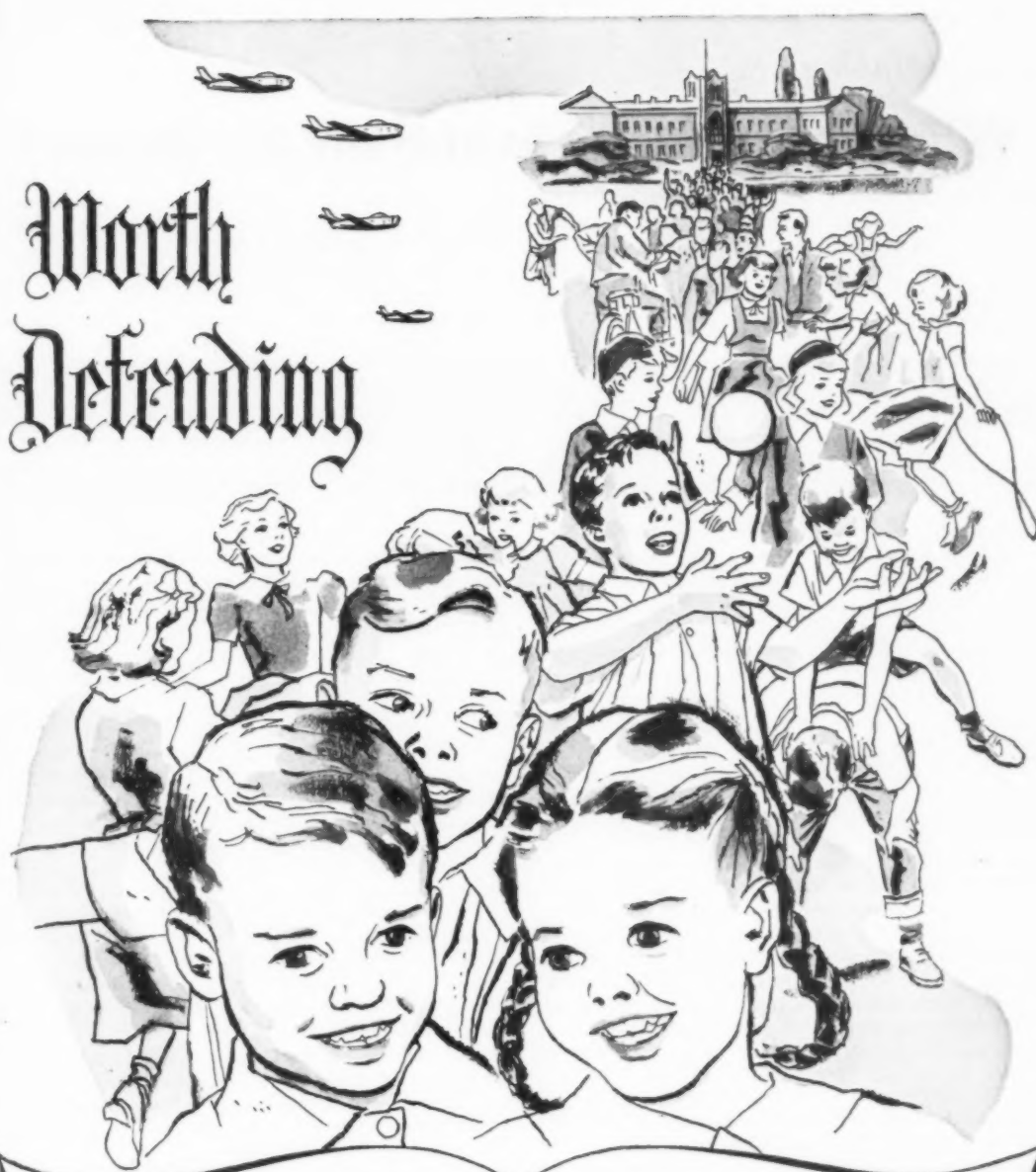
• **Messerschmitt AG** (40 Tolzerstrasse, Munich 25). The Augsburg plant currently builds sewing machines, while a subsidiary company in Regensburg constructs automotive equipment. It is estimated that there are 3000 former aircraft workers available in the Augsburg area if required. Last year Messerschmitt GmbH, another subsidiary, was founded in Essen. The company has a design office in Spain located in the Hispano Aviacion plant at 102 Jacinto, Seville. Messerschmitt has always been predominantly associated with fighters (notably the Me 109).

• **Siebelwerke-ATG-GmbH** (Odeonplatz 6, Munich 22) results from the merger in 1952 of Siebel with the ATG company, one of the giants of the German heavy industry. The company's former plants are mainly in the Soviet Zone but facilities are available in Oberpfaffenhofen, in Western Germany, for the projected production of light planes and trainers (probably including Italy's Macchi MB 308). Most of the Siebel engineers were forced to go to Russia after the war but many have now found their way to Western Germany. Siebel built personal aircraft, light transports and—towards the end of the war—carried out experimental work on rocket fighters.

• **Weser Flugzeugbau GmbH** (Bremen) currently builds automotive equipment at its Varel plant. The Nordham factory was taken over in 1949 by another firm, but two other plants (Einswarden and Lemwerder), now used for storage, could be made available for aircraft work in addition to the Varel facility. Weser built the Junker Ju 87 dive bomber during the war.



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## What is Radford's Stand on Air Power?

**V**IRTUALLY everyone in the Department of Defense and in top positions in the Republican Administration has placed on the record his opinions about the nation's defense requirements. Oddly enough, the one hold-out who has never made a clear-cut statement of defense planning is the man who must formulate this program and implement its operation—Adm. Arthur Radford, chairman of the Joint Chiefs of Staff.

His civilian bosses in the Defense Dept. and each of his immediate subordinates heading the individual services have appeared on question-and-answer radio and TV programs, have granted printed interviews in national magazines, and in general have been available for interviews.

Not so with Radford. So far as the press is concerned, he is the invisible man.

### What is Radford's thinking about air power?

From inside the Pentagon, this reporter has finally been able to get a definitive and "official" briefing on this vital subject. This comes from his top-level associates. It outlines Radford's code, which is perhaps the greatest single factor which will determine not only the "balance of forces" in the crucial months ahead, but also the manner in which the next war will be fought.

In general terms he made his position on air power clear when he told the National Press Club last December: "Today's emphasis is actually pointed toward the creation, the maintenance, and the exploitation of modern air power. Today there is no argument among military planners as to the importance of air power. Offensively, defensively, and in support of other forces, it is a primary requirement."

In short, Radford is in favor of air power in general—but in what form? Is it primarily and most importantly the intercontinental bomber? Or is it the carrier-based bombers of the Navy? Or the Air Defense, or Tactical Air Commands? Or a mixture of all, with no emphasis on any one form?

His statement above has led many to believe that Radford has come to regard air power—in whatever form—as the dominant force in war, overriding in importance forces of the land and sea. He has not publicly said so, irrespective of how he might feel personally. Perhaps he cannot say so in his position as chairman of the Joint Chiefs of Staff.

### Here, then, is a brief outline of Admiral Radford's thinking:

In the first place, he does not view air power as *the* dominant military force, but does view it as *a* dominant force. He believes that the importance of air power is steadily increasing, and that it is an indispensable element of modern warfare.

It is a generally held belief among air power advocates that the steadily increasing importance of air power will mean that the relative importance of ground and sea forces gradually will diminish. The trend in that direction has been clearly indicated in the various cuts and proposed further cuts in the personnel of the Army and the Navy. This has been explained by saying that the increase in effectiveness of new weapons permits of fewer men being employed.

But that explanation fails to take into account the fact that the effectiveness of the weapons of air power also has increased. Yet nobody has suggested that we cut back the Air Force—or cut back naval aviation. On the contrary, both are being strengthened—while the Army and Navy as a whole are being reduced.

Admiral Radford believes that as the importance of air power and new weapons increases, the importance of ground and naval forces (other than naval air) does *not* necessarily diminish. He believes that each of the Armed Forces has an important role to perform, and that the Joint Chiefs of Staff would not care to fight a major war without some of all the Armed Services. Today it is more a matter of relative emphasis of effort.

Today's emphasis, Admiral Radford feels, is on modern *national* air power—the composite strength of all air elements of the United States. However, he has said—in a speech, December 14, 1953—that the Joint Chiefs are opposed to radical changes in a hurry because they are militarily undesirable; and that, from the standpoint of the security of this nation, they are not practicable.

He believes that if we view the collective strength of the free world, it will be clear that the United States is in the best position of any of the nations to provide modern air and naval power as the principal military contribution. He is convinced—as who is not?—that one of the most apparent considerations affecting the nature of the next war is the tremendous magnitude of destruction which can be inflicted swiftly anywhere.

Yet in none of his published utterances has Radford come out in favor of this intercontinental weapon carrier. On the contrary, it was only three years ago when he was viewing with complete disfavor the Air Force's B-36 and casting doubts upon its ability to negotiate the skies of Soviet Russia and survive.

Admiral Radford, it should be noted, is a flying admiral, not one of the deckbound variety. However, to expect him to practically turn his back upon his own service, the Navy and its naval aviation, would be asking too much of him.

Admiral Radford is in a position where he must, to all intents and purposes, sit on the fence when conflicting interests of the Armed Forces are under discussion. He is the Chairman of the Joint Chiefs of Staff. He must have a balanced mind, in conformity with our announced policy of having "balanced" forces. So far, he appears to have kept his equilibrium remarkably well.

He is forward looking, and believes that the Joint Chiefs of Staff are completely cognizant of the need for constantly reorienting our plans and programs toward the utilization and employment of new weapons, and he believes that one of the most effective means of defense is the deterrent effect of a strong offensive capability.

Wars are both prevented and won by offensive forces. Of all these offensive forces, the most powerful is the long range bomber. It is to be earnestly hoped that Admiral Radford will agree with this conclusion.

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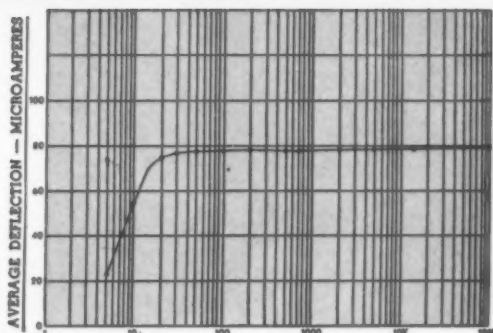
Negative feedback applied to the two audio stages stabilizes the receiver so that it will perform satisfactorily when the mutual conductance of any or all of the audio tubes is reduced by 50%. AVC voltage on the R.F., I.F. and first audio tubes provides a constant output with varying R.F. input. The AVC characteristic of the receiver is flat from 30 to 100,000 microvolts with standard factory adjustments. These features provide a flat flag current response and allow the flag to be set to very close limits to meet strictest airline requirements. If operating conditions require more or less course softening, a simple screwdriver adjustment of the potentiometer is all that's necessary.

The receiver utilizes a high voltage d-c plate and screen supply obtained from a self-contained dynamotor or 400 cycle a-c power unit. Use of the appropriate dynamotor or a-c power unit makes the receiver operable from a 27.5 volt d-c source or 115 volt, 300-1000 cycle a-c source with 27.5 volts d-c for relays and filaments. The two types of power units are interchangeable.

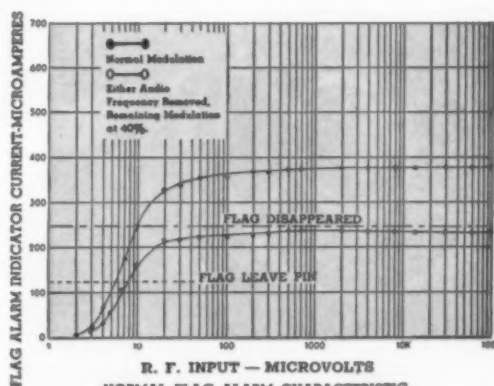
Another important characteristic is the low value of conducted and radiated interference. Spurious responses are approximately 60 db or more below the level of the desired signal. Precise frequency stability is accomplished through use of a group of twenty crystals for control of the injection oscillator. These crystals are in accordance with MIL-C-3098, except for case marking.

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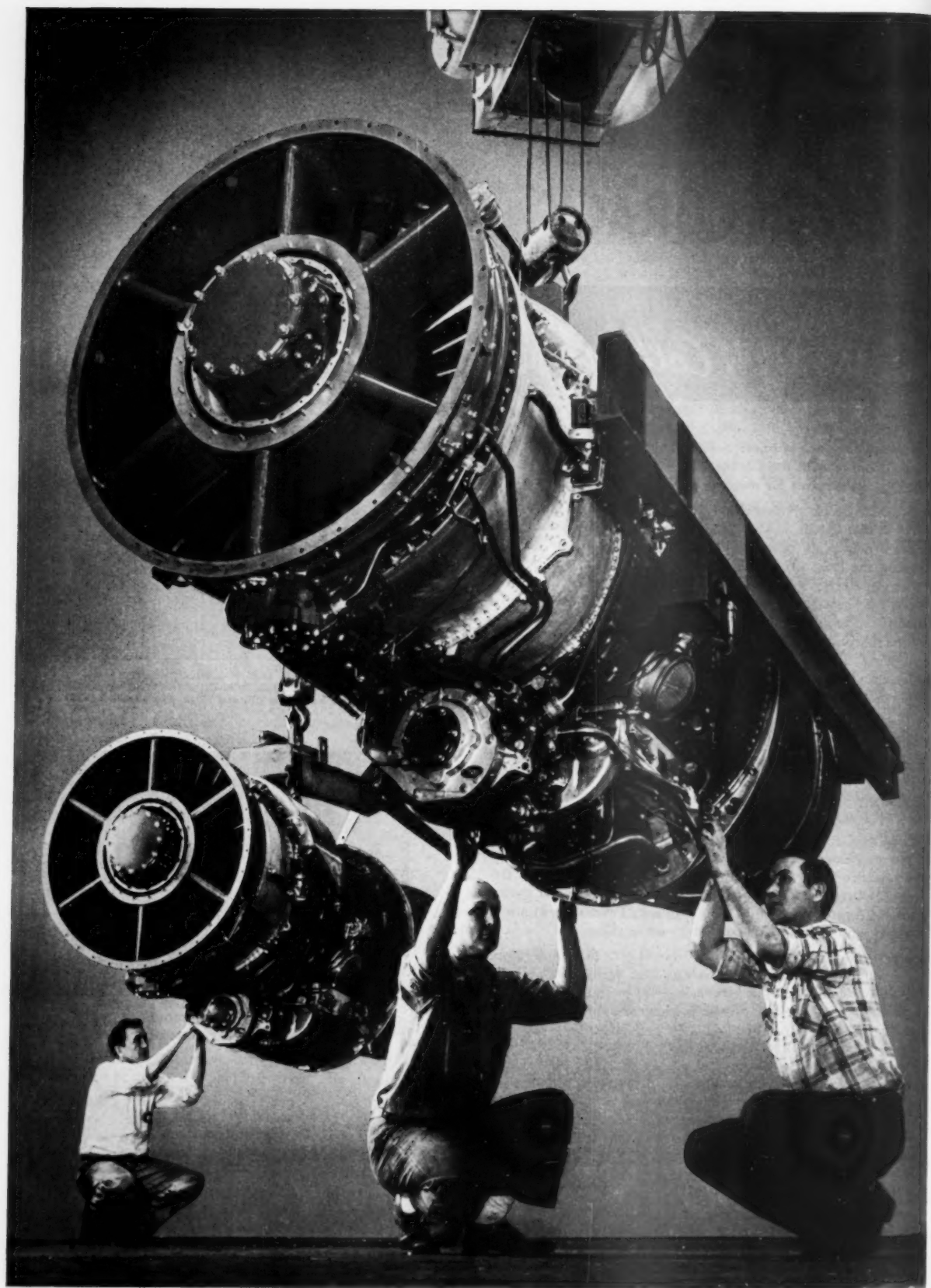
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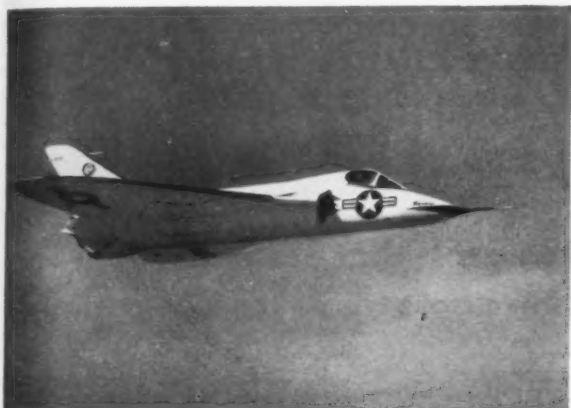
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North American's F-100 Super Sabre, fastest Air Force jet fighter, is powered by Pratt & Whitney Aircraft's J-57 engine.



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The J-57 is fully justifying the long years and intensive effort required for its development, providing pace-setting performance for a new generation of American aircraft.

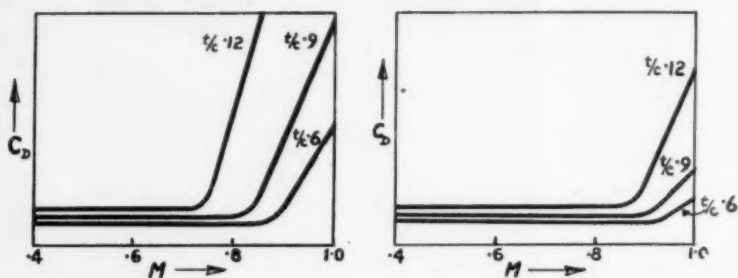
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## Compressibility Drag vs. Wing Thickness



COMPRESSIBILITY DRAG ( $C_D$ ) is shown at left, above, for straight wings 12%, 9%, and 6% thick. Thinnest wing postpones drag rise until Mach 0.9 is reached. At the right, results for the same wings swept back 45°.

## Three British Views on Wing Design

Each designer knows the merits of his own configuration, but few are familiar with alternatives.

By JAMES HAY STEVENS

**L**ONDON, ENGLAND—Considering that all airplanes are now monoplanes, there is more difference in individual shape than ever before—planform, thickness ratio, sweepback, aspect ratio, all are variables.

The reason for the divergence of informed opinion is that performance has outstripped knowledge. The parted ways are emphasized by concentration of research on a chosen design, so that its proponents can declaim loudly that theirs is the only way to fly fastest, highest, farthest and with most load.

The protagonist of delta, crescent, aero-isoclinic, or what have you, can comment with sure knowledge on his own conception, but few if any achieve

objectivity when assessing wings as a whole. Quantitative assessment without detailed study (and access to classified test results) is impossible, but a qualitative picture can be fairly drawn.

The wave drag of compressibility, which comes on suddenly between about Mach 0.75 and 0.95, is the main factor affecting wing shape.

Increased sweep and reduced thickness/chord ratio can delay the onset of this drag. For example a six per cent straight wing can reach Mach 0.875 before drag rises, while a 12% wing swept to 45° is almost as good.

Large degrees of sweep, around 60° or 70°, coupled with a very thin airfoil also ameliorate the drag rise and the attendant instability, so that less power is needed to ride the sonic barrier.

The physical solidity of the "sound barrier" is not always appreciated. For a recent speed record attempt an engine manufacturer offered 1300 pounds of level static thrust boost—which gained two miles an hour.

The designer of a jet bomber, in transport, is secondly faced with the over-riding problem of obtaining long range despite high specific fuel consumption. This is met by flying high and fast—and from this basis spring all the other characteristics.

The traditional method of increasing range is to reduce induced drag by increasing aspect ratio. The high aspect ratio gives good take-off and high-altitude performance. Aerodynamically it is excellent, but structurally it has always been tricky. Today, with the complications of thin airfoils, sweepback, and aeroelastic effects, it provides one of the most difficult design complexes known.

Although high aspect ratio gives low span loading, the wing area cannot be great without incurring heavy structural penalties. This is serious because of the considerable loss of lift with increasing Mach number above 0.6. At 50,000 feet, where the speed of sound is only 680 mph, a cruising speed of 600 mph represents Mach 0.88. Here the lift coefficient is only some 40% of its normal value.

Here lies the fundamental difference between the United States and United Kingdom approaches.

The British sacrifice low drag in favor of low wing loading in order to meet the threat of reduced  $C_L$  and so maintain ceiling and high-altitude maneuver margin. There is also a geographical influence: the British Isles are small and there is little space for 10,000 foot runways, so the RAF has specified bombers that can take off and land in something like one mile.

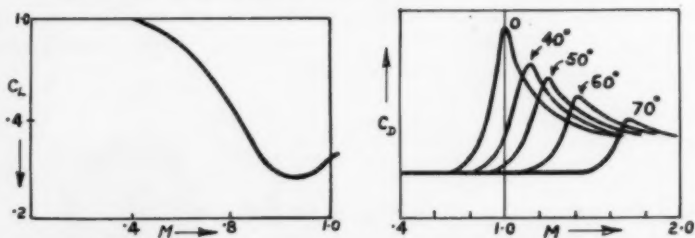
This is the background for the large wing area of the British bomber—even the relatively high aspect ratio Victor has about double the surface of the B-47.

Starting with the biggest area of all, the Avro Vulcan delta, what does the designer gain and lose?

• In the 'Thirties Arup and Zimmerman proved that ultra-low-aspect-ratio wings (around two or three) possessed unusual lift properties at low speeds and high incidence. Lippisch thought of combining low aspect ratio with sweepback, giving the delta planform. This shape is stable without a tail, and compressibility instability is less than with straight or swept wings.

• Structural shape is excellent. Sharp taper ratio gives a stiff cantilever layout that is easy to build. Even with very low thickness/chord ratio, the

## Loss of Lift and Effect of Varying Sweep



LIFT COEFFICIENT ( $C_L$ ) falls off as Mach number increases (see graph at left, above). This is a representative curve. At right, the effect of increasing sweep on compressibility drag for 10% thick wing at varying speeds.

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by



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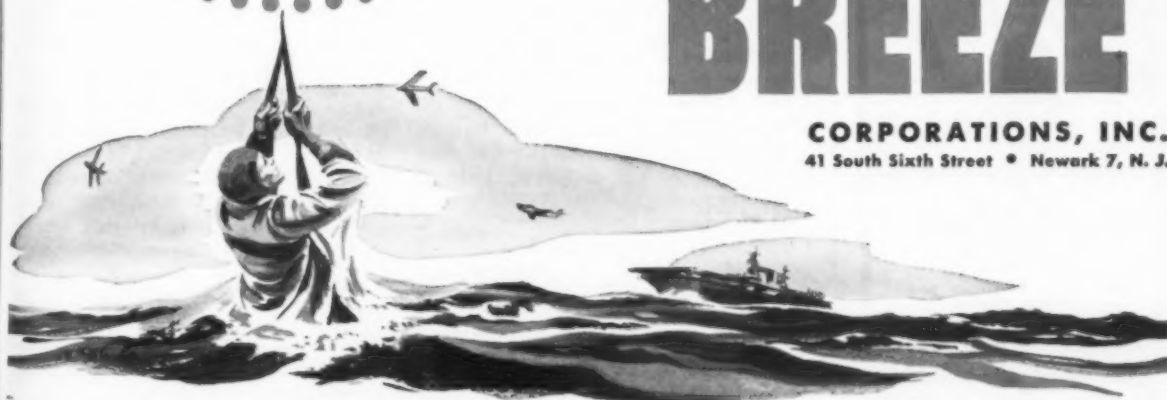
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geometry gives large internal stowage.

- **Engines** can be completely buried apart from jet pipes. But ducting is long—some 70 feet on the Vulcan—and losses are therefore considerable.

- **Envelope is clean**, almost without excrescences, but wetted area is large, with much metal, only partly compensated for by absence of tail, rear fuselage and flap hydraulics.

- **Large area** and low wing loading give high ceiling, good climb, altitude maneuverability, and low stalling speed.

- **Ground effect** gives automatic landing from trimmed glide—this may be strong enough to require forward stick.

Valiant and Victor have relatively high aspect ratios. Each has a form of compound sweep, a way of solving both structural and aerodynamic troubles.

- **Sharp root sweep** allows thickening of the wing to hold engines and landing gear. This greater sweep also counteracts local air flow speed-up due to fuselage.

- **Wing tips** are less swept and thinner. This reduces tip stalling and maintains aileron effectiveness at high subsonic Mach numbers. Stresses at tip are less and it is easier to design a thin wing.

- **Valiant has torsion box** outer planes and two-beam center section which acts as a structural hinge and, with the reduced sweep, prevents aileron reversal or tip load-shedding.

- **Victor has three sweep/thickness changes.** Tip is graded down to about six per cent, giving similar sub-script along span. This means addition of droop snoots to give more camber and preserve wingtip lift at low speed.

- **Compound sweep** gives fair wing fuel stowage, but fuselage is main container. Drop tanks are essential for full range.

## Ground Effect

Ground effect operates with the Victor because the large area wing is close to the ground, but the high-wing Valiant lacks this advantage.

Briefly, ground effect arises from the induced downwash from the wing coming in contact with the ground. This cushioning increases the lift coefficient and, because of the forward c.p. position of the sharp-swept wing root, there is also a nose-up pitching moment.

Automatic levelling out from a trimmed glide at 10 mph above the stall means that the pilot can cut his throttles at 50 feet and await results. For blind landings and, of course, with tired pilots, this is a virtue of great value.

The B-47 high aspect ratio swept wing of constant, or near constant, taper must, first, be flexible.

- **Thick-skin, elastic wing design** is essential—a structure more suited to U.S. well-tooled manufacture than to British practice.

- **Wing shape dictates pods** for the engines. (This is not the place for a discussion of pods versus buried engines.)

- **Wing shape also dictates bicycle landing gear**, which is of debatable value—since it occupies valuable fuselage space and restricts landing approach speed and angle.

- **Relieving moments due to pods** and drop tanks help to keep down structure weight.

- **Pods can be used** to overcome aeroelastic twisting and mass balance the wing.

- **Simple, straight taper**, proponents say, together with relieving moments and absence of wing or spar cut-outs, ensures lightest structure.

Complications of high aspect ratio in this form include aileron reversal, load-shedding, dutch roll at high speed, and lateral instability when loaded asymmetrically.

## Aero-isoclinic Wing

One voice has been raised to suggest a cure for high-aspect-ratio troubles at high speed. David Keith-Lucas of Short Bros. & Harland not only advocates the aero-isoclinic wing, but has built one for his experimental Sherpa.

A prime trouble with the swept wing in any form is the geometrical fact that as it deflects the tips lose incidence. (This is easy to show with a model but is difficult to describe. It arises from the oblique hinge effect of the wing root attachment to the fuselage.)

The aero-isoclinic wing is so designed that as it bends under air load the tips retain constant incidence. This is achieved by dividing the flight loads up, with booms to take bending at 25% chord and a torsion box between 35% and 60% chord. The leading edge is only attached to the upper boom, thus leaving it free to warp as necessary to maintain incidence.

The risk with this structure is that divergence may occur: that is, the tip incidence will increase, causing the lift to increase, and so on until it twists off.

With such a flexible wing ordinary ailerons would cause reversal, so movable tips are used, which, being hinged around the c.p., impart no twisting force to the wing.

Keith-Lucas has also cashed in on the rearward position of his "controllers" to dispense with a tail altogether, and propounds five virtues for his system:

- **Wingtip stall is impossible**, be-



signed to cause controllers are always at less incidence than the wing.

• **Aileron reversal cannot occur**—the same goes for elevator reversal.

• **There is no adverse yaw** due to aileron movement (dutch roll) and rolling moment remains positive throughout speed range. Tips pivoting independently of wing give sufficient control to overcome dihedral effect of sweep in yaw.

• **Stiffness ceases** to be the design criterion and weight can be saved by designing for strength alone.

• **Flutter problems go overboard** with conventional ailerons.

The aero-isoclinic wing is claimed by Keith-Lucas to be the best answer for overcoming the aeroelastic problems of making a wing "capable of long range at high altitude and high speed low down."

In the transport field the proponents of each of the established wing shapes have offered adaptations of their military designs; Boeing, Avro, Handley Page and Vickers have each an entirely different solution.

Save for the Vickers 1000, which has a low wing, the main variation is in a large capacity fuselage. The wing retains the shape and, presumably, the

vices and virtues of the original.

In the turboprop transport field there is the possibility of a thin, straight wing design. Those who are in favor of the high pressure ratio, free-turbine powerplant (as opposed to pure jet or by-pass) maintain that high efficiency thrust can best be obtained at around 550 mph, between 25,000 and 35,000 feet.

### No Sweep

To obtain efficient slipstream and wing airflow it is no good thinking of sharp sweepback. In this configuration the wing must be straight and thin—the designer using some of the weight saved by cutting out sweepback to build strength into a wing root about eight per cent thick.

Droop snoots would increase camber to give reasonable stall characteristics and the unpleasant effects of sweep would be absent in any event.

Sir Frederick Handley Page probably has the last word when he says "The dualism between propulsion and lift production, which has existed for so long, is vanishing and we are moving towards an integration of both regimes. Results of basic research indicate that substantial improvements of performance, due to drag reduction or lift augmentation, can be obtained

through the by-passing of power to control the boundary layer or the circulation and, hence, the lift of the wing."

• • •

## RCA to Build C-Band Airline Weather Radar

The Radio Corporation of America plans to develop C-band (5.7 cm.) airborne weather radar designed to meet commercial airline standards. The selection of C-band radar, RCA indicates, was based upon studies conducted by McGill University and upon the results of a development and flight test program conducted jointly last year by RCA and United Air Lines.

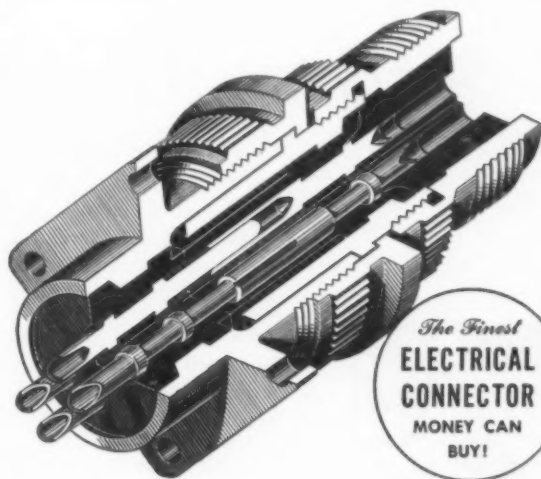
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Pay to the four lines (American, TWA, United and Capital) was about \$345,654. The 2644 tons amounts to over 185 million letters.

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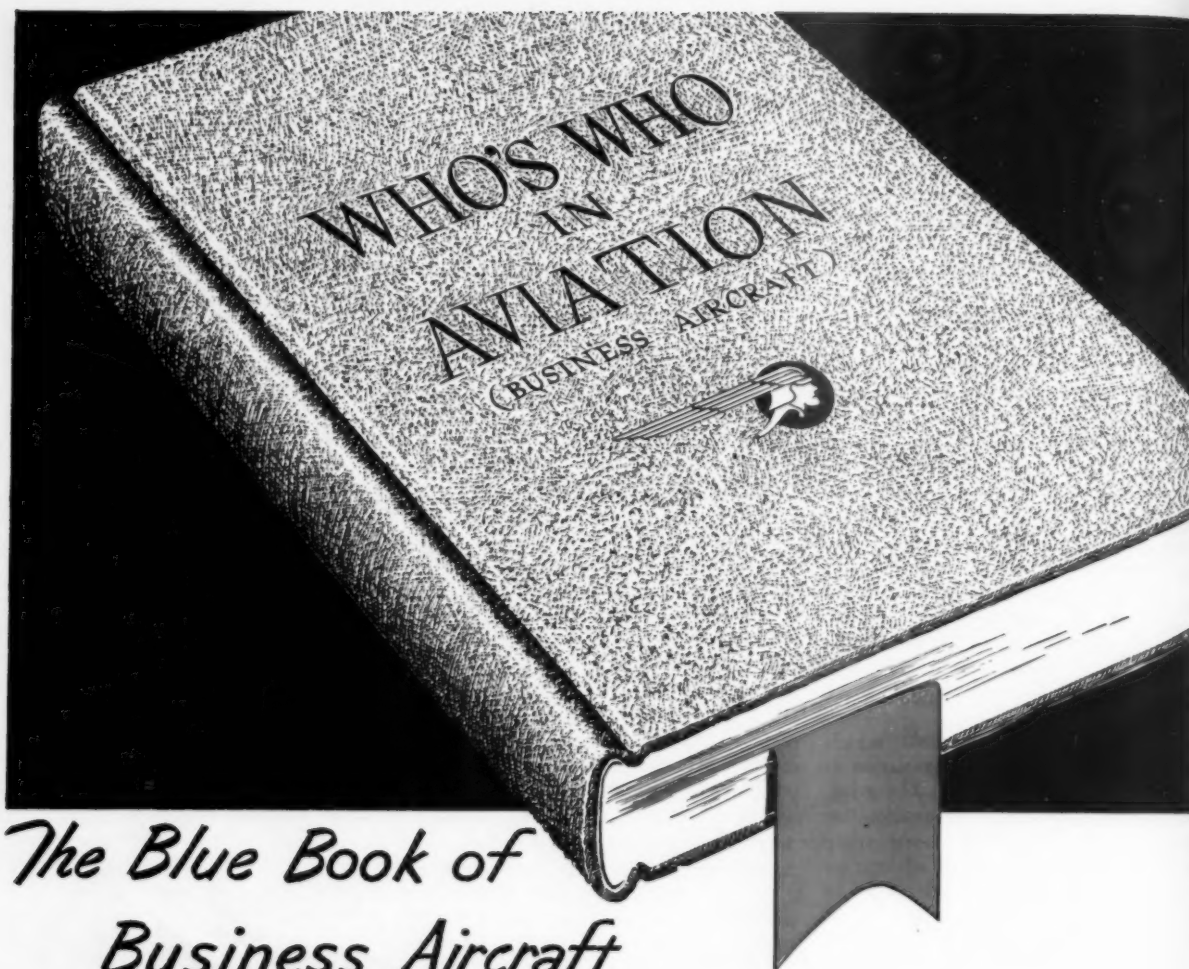
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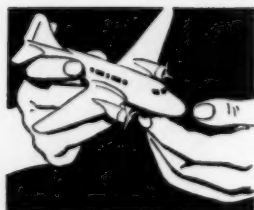
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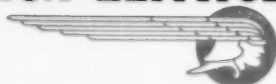
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AMERICAN AVIATION



TRANS-PACIFIC ROUTE OF JAL is flown by three Douglas DC-6B's with more on order. Carrier flies DC-4's on domestic routes, hopes to get Comet II's in '55.

## Japan Air Lines Opens Pacific Service

Inaugural flight from San Francisco to Tokyo marks beginning of expansion into world-wide routes.

By WILLIAM D. PERREAULT

**T**OKYO, JAPAN—On February 2 Japan Air Lines, "Wings of the New Japan," started trans-Pacific Air Service connecting this city with San Francisco, via Wake Island and Honolulu.

The inaugural flight, the beginning of twice-weekly schedules across the Pacific by JAL, represented the start of an ambitious expansion of Japan's domestic airline into world-wide air routes. Before the year is out JAL hopes to extend its San Francisco terminal southward to Sao Paulo, Brazil, via Los Angeles, Mexico City, Panama, Lima, and Rio de Janeiro.

It also plans on flights from the southwest of Japan to Seoul (Korea), Bangkok, Karachi, and Teipei (Formosa) during the year.

All of these operations are being conducted with Douglas DC-6B aircraft, of which JAL has three plus two on order for late 1954 delivery. By April, 1955, Japan Air Lines hopes to have two de Havilland Comet II's and hopes late that year to expand its routes from Karachi to London via Cairo, Rome, and Paris.

Some of these plans have already taken firm shape and been facilitated by bilateral agreements between the governments of Japan and the United States, Britain, Netherlands, Sweden, Denmark, Norway and Thailand. Others are under negotiation with France, Viet Nam, Pakistan, Canada, Brazil, Belgium and Mexico. Not yet under way are bilaterals with the Philippines, Australia, China and India.

The scale of these proposed operations is no less impressive than the general operational feat JAL has undertaken. The inaugural flight represented

the first scheduled international flight by a Japanese airline since the start of the war in 1941. At that time Dai Nippon Aviation Company was conducting air service between Tokyo and Bangkok with 11-passenger Mitsubishi MC-20's and from Palau to Portuguese Timor in Kawanishi flying boats.

Operation of three Douglas DC-6B's over one of the world's longest overwater routes, some 6600 miles, was a radical innovation for a country that had been forbidden any form of aviation activity for many years and thus missed many of the major technological developments of the postwar years. Japan's real aviation leaders had been purged by the postwar agreements of the Occupation forces, effectively eliminating all past experience.

Today Japan Air Lines is operating six Douglas DC-4's on 1400 miles of domestic routes, stretching from Sapporo in the north to Fukuoka in the south of Japan. Fourteen Transocean Air Line captains and nine co-pilots, plus 12 Japanese co-pilots, operate this fleet, which is soon to be increased by two additional planes.

The international operation is crewed by 13 TOA captains, seven co-pilots, flight engineers and navigators. It will probably be four or five years before international flights are piloted

by Japanese crews, although native co-pilots will be introduced earlier. On the domestic routes Japanese crews may take over in a matter of 18-24 months.

The present DC-6B's will be supplemented in late 1954 by two more of these planes, with which JAL hopes to expand its services.

The Comets would initially go into trans-Pacific operation, according to JAL president Seijiro Yanigita. Yanigita, for 30 years Governor of the Bank of Japan, and Kunizo Hara, long-time transportation leader in Japan and chairman of the board of JAL, are the two principal figures in the JAL operation.

Today Japan Air Lines consists of some 600 employees, with the majority of these engaged in domestic operations and many in training. This total is supplemented by another 500 in Japan Aircraft Maintenance Company (JAMCO), also headed by Yanigita, which is handling all of JAL's maintenance and overhaul of domestic aircraft, routine maintenance on JAL's DC-6's, plus general work for the Scandinavian Airlines, Canadian Pacific, KLM, Air France, and Thai Airways.

JAMCO is about 60% JAL-controlled, with the remaining ownership divided between Transocean and Northwest Airlines almost equally.

At this time JAL gets seven hours utilization from its DC-4 fleet and seven and one half hours daily use from its DC-6B aircraft. Utilization of DC-6B's will be upped to nine hours a day in April when JAL starts a weekly tourist flight from Tokyo to Honolulu and return.

JAL will operate its Tokyo-San Francisco line with 12 first class passengers in the rear of the cabin and 47 tourist seats forward of the main cabin door and buffet.

Japan Air Lines has already taken delivery on one de Havilland Heron, a small four-engine transport, and expects delivery of two others late this month. These were initially intended for feeder operations which JAL has been authorized to operate. Present feeling is that the company will not operate the feeder service, and negotiations are under way between JAL and Tokyo Helicopter Company.

Japan Air Lines currently has \$5½ million capitalization, with ownership split equally between the government and private investors. The only government control exists in the form of mandatory government approval of the two top officers—the president and board chairman—although these are initially elected by the stockholders. This year JAL expects to double its capitalization to handle the purchase of new equipment and other operational expansion.



Yanigita



Hara



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The new generator (Model 2CM244) has the highest capacity of any wide-speed-range commercial unit of its size (6½-inch frame). Resulting from G.E.'s continuous interest in the requirements of commercial airlines, the new equipment offers these *exclusive* features:

- **QUICK-ATTACH-DETACH (QAD)** mounting flange permits installation in minutes instead of hours.
- **CLEARANCE-TYPE SHAFT** absorbs engine drive vibrations and reduces spline wear to insure longer life and reduced maintenance.

- **SHRINK-RING COMMUTATOR** permits higher speeds without commutator distortion to provide greater service life.

- **NEW CORED BRUSH**, a distinct advance in aircraft brush design, eliminates pre-filming of commutator, improves commutation, and reduces commutator temperature.

The new aircraft generator also offers these improvements:

1. Silver-plated, cast-bronze brush holder minimizes brush chatter and increases contact efficiency.
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3. Pre-lubricated clearance-type shaft (internally lubricated) provides for increased operating life.

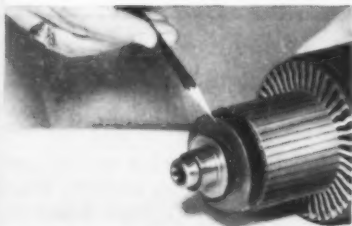
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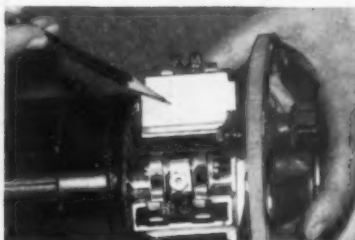




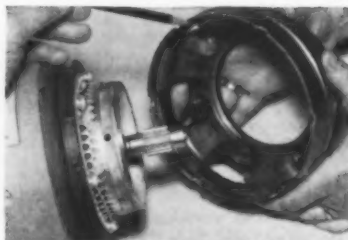
## Exclusive features of new G-E generator on DC-7



**SHRINK-RING COMMUTATOR** withstands higher speeds without distortion to insure long service life.



**CORED BRUSH** eliminates pre-filming of commutator, improves commutation and reduces commutator temperature.



**QUICK-ATTACH-DETACH** mounting flange sharply reduces time required for generator removal or installation.



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75ST HI-SHEAR rivets combat "head popping" and wrinkles in skin panels more effectively than 24ST DD rivets. Combining higher material strength and close tolerance heads, the 75ST HI-SHEARS permit higher shear and tension allowables, reduce shop problems and improve surface flushness.



## HS25

rivets with the AN426 styled head permits countersinking in skin minimum thickness of .072 or more. Hole preparation is accomplished with same standard tools.



## HS23

with the small HI-SHEAR styled head permits countersinking in thin gauges (.051 min.) and eliminates sub-countersinking or sub-dimpling in frame-to-skin attachments, extrusions, stainless steel, titanium or where dimpling clearances are lacking.



## HS26

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- 75 ST HI-SHEARS drive with 1/2 the force of DD rivets and eliminate "ice-boxing" DD rivets.
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- 75ST rivet pin uses an A17ST HS24 collar (dyed blue).

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## West Coast Talk

By Fred S. Hunter

ONE WAY to keep tabs on the aircraft industry in these parts is to watch the employment ads in the Los Angeles newspapers. They're pretty good barometers of how the winds blow.

There's still some procurement of factory help going on, but not much. What there is strictly in the skills. But the competition for engineers is unceasing, and it looks like it probably never will end. Some of the ads tell their own stories.

AiResearch, for example, seeking thermodynamacists, sings this siren song: "This is an opportunity for engineers to work with a leading company in the field of aircraft air conditioning on the problems associated with the breaking of the Thermal barrier." The AiResearch ad writer puffs up "thermal" with a capital "T"; perhaps to show how old hat the supersonic barrier has now become.

Lockheed and Northrop disclose that they, too, are concerned with the thermal problems of high speed flight by advertising vigorously for experienced thermodynamacists as well as aerodynamacists and the various other types of engineering specialists. "Calling thermodynamacists to new careers in its expanded development program . . . Nuclear Energy . . . Missiles . . . Special Research Studies . . . XF-105," reads a Lockheed ad. Hmm! How fast do you suppose that XF-105 will go?

Northrop reports "several openings in varied phases of thermodynamics such as equipment conditioning, aerodynamic heating, fluid flow, electrical conditioning system and engine accessory cooling systems." The Hawthorne company also does a little added coaxing with this list of propaganda: "There is a permanent job waiting for you at Northrop working on the new Snark and the Scorpion F-89D, America's heaviest armed fighter." Are we to take this literally that there is a NEW Snark?

What's North American Aviation up to besides trying to sell the Air Force on an interceptor version of the F-100? "Rocket Engines," says the big type in an ad. NAA also would like more engineers to work on airborne optical equipment, adhesives and sealants, flight control systems, fire control, high speed turbo machinery, hydrodynamics, high pressure pneumatic and hydraulic systems, gas generating systems, servo mechanisms and what have you. This weapons system business is really moving into high gear out Inglewood way.

Down in San Diego, Ryan Aeronautical buys space to announce engineering openings on an "important new airplane project '69'." Putting quotation marks around "69" thusly is Ryan's way of hinting that it has a new airplane project in the works, but it's classified. Security is getting very tough these days.

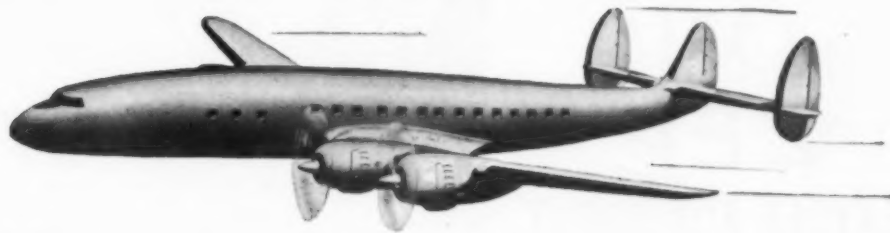
Lockheed's appointment of Willis M. Hawkins as chief engineer of the new Missile Systems division is the tip-off on how big a role the new division is destined to play in the Burbank organization. Hawkins is one of the brightest stars in the entire Hibbard galaxy; a design engineer of extraordinary talent. Lockheed may have been a little slower than some of the other aircraft manufacturers in branching out into the guided missile field, but it obviously is out to make up for lost time in a large way.

Western Air Lines distributes questionnaires to first riders after they've made their trip seeking their reactions, their comments on WAL's service and so on. Terry Drinkwater, WAL president, was all but floored the other day by this response from an elderly lady following a Los Angeles-San Francisco flight: "Nothing to it; it's just a hot breakfast sandwiched between two bus rides."

Douglas Aircraft Co. says based on present fares a payload of only 16 passengers can defray the direct operating costs of the DC-7.



**MORE  
FLIGHT HOURS**



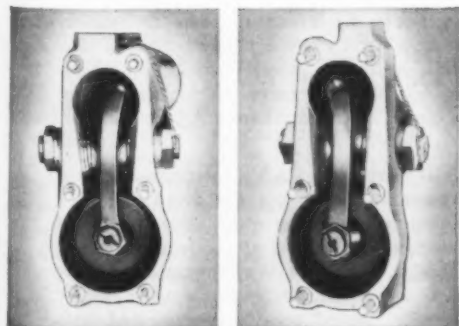
**BETWEEN  
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WITH NEW**

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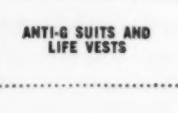
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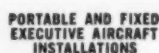
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## Extra Section

By William D. Perreault

**T**OKYO, JAPAN—It's always surprising to get so far from home—9117 miles via my Washington, San Francisco, Honolulu, Wake Island route to Tokyo on the pre-inaugural flight of Japan Air Lines—and find so many familiar faces. A prime example is **M. B. ("Mal") Freeburg**, long associated with Northwest Airlines in top operations jobs, who is serving under a two year contract with Japan Air Lines as a consultant. Freeburg is doing a good job as general trouble-shooter for an airline which can really use his type of experience. Freeburg, the first U. S. pilot to receive the Congressional Air Medal of Honor, has his charming wife in Tokyo with him.

Another familiar name in both manufacturing and airline circles around the world that has contributed to the JAL operation is that of **Ben Garlow**, one of Douglas Aircraft Company's group of multi-purpose test pilots and an effective good-will ambassador. Garlow made the round-trip flight on the DC-6B which preceded the official inaugural flight, serving as operational advisor to the eight-man crew, encyclopedia on aviation to the group of travel editors on board, and general Tokyo guide.

Transocean Air Lines, which is supplying the flight crews on both domestic and international flights of JAL, was prominently represented both in the air and on the ground. The four TOA captains on board were **Joseph A. Stachon**, **Neil R. Hennessey**, **Charles W. Roach**, and **Royal W. Minson**. Navigators were **DeWitt Vernelson** and **Bill Charnley** while **Marvin Darrah** and **John Parsons** completed the crew as flight engineers. Two other Transocean pilots serve as chief pilots for JAL. **Captain Joiner** serves as chief pilot on domestic routes and handles general pilot training activity while **Captain Turner** is chief pilot on the international operation. On the ground TOA's **Dick Larkin** fills the role of chief dispatcher, **John Hann** and nine other technicians from Transocean guide the maintenance activities of Japan Aircraft Maintenance Company, and **Charles H. Hall**, a former Pratt & Whitney man, is technical advisor on engines.

There has probably never been a crew with more cabin attendants and a proportionate amount of service. On board were five attendants, including four Japanese stewards and stewardesses. The fifth member, **Alice "Ty" Attwood**, United Air Lines' assistant chief stewardess in San Francisco, was equal to another half dozen run-of-the-mill stewardesses. She has handled JAL's stewardess training program in such an effective manner that at least one other airline has asked for similar coaching. The student stewardesses liked her too—they gave her a lovely pearl ring in tribute.

CAA is well represented in Tokyo, as it was en route on our flight. At Tokyo **H. J. ("Hal") Carrick** heads up CAA's office, where he serves in a useful role for the airlines, manufacturers, and the general aviation of Japan. It is always remarkable how much the rest of the aviation world depends on U. S. standards of operation. This is doubly so in Japan where CAA acts as the central agency for sharing U. S. views.

CAA's **Jim Beasley**, chief advisor in CAA's International Field Office at San Francisco, accompanied us on our trip as official CAA representative. Actually he and his team are quite active in JAL's operation since the San Francisco terminal is at his front door. At Honolulu we saw **Ernie Hensley**, long-time Washingtonian, who is now assistant regional CAA Administrator working with **Edgar Smith**. **Ernie** and his lovely wife "**Rusty**" seem very contented with this newest assignment and gave us a cook's tour of the island.

The real lesson of all this is not the reciting of a group of names of people I know and whom you probably know. It's just an example of the impact which U. S. aviation procedures and policies have around the world, as top representatives such as these go into areas where other countries are having trouble and lend their advice and assistance.





TURN-ON-THE-HEAT-IN-'54 theme was emphasized at Delta-C&S sales conference by handing each sales manager a blank card. Holding a match under card exposed '54 station sales quota, written in invisible ink. Photo shows T. P. Delafield, general sales manager, giving card to Dick Brodhead, Detroit manager.

## Tough Competitive Year Seen in '54

Delta-C&S outlines plans to buck competition while boosting revenue 15% during first six months.

By ERIC BRAMLEY

**A** MORE AGGRESSIVE selling job, supported by a substantial advertising and promotion program, is being counted on by Delta-C&S Air Lines to produce \$26 million in passenger revenue in the first six months of 1954.

This is an increase of more than 15% over revenue attained in the same 1953 period, before and during the Delta-Chicago & Southern merger. And it's an increase being sought in the face of a market that company officials believe is leveling off.

As was pointed out at the recent Delta-C&S annual sales conference, the company must continue to show higher revenues, even with business leveling off, because of still-spiraling costs.

"You have to run as fast as you can to stay where you are," one official noted.

Delta-C&S intends to try for that little extra spurt. To support the sales effort it is spending \$1,500,000 on advertising and is conducting a sales incentive contest that is undoubtedly one of the best in the industry.

This was the first sales meeting since the merger last May. In this observer's opinion, remarkable progress has been made in merging the sales departments. Getting everyone on the same team, using the same signals, isn't easy. Yet it has been accomplished, to a large degree, in a short time.

Here are some of the '54 goals (figures are for the entire year):

- \$16,500,000 in interline revenue, up 27% over last year.

- \$5,000,000 cargo revenue (mail, express, freight).

- Over \$1 million in convention sales.

- Sale of considerably more than 10,000 package vacations.

- Sale of 564 new air travel plans.

The following description of the grand award (there are many others) in the sales contest will give some idea of how worthwhile the company is making attainment of the \$26 million.

At the station producing the greatest dollar volume of revenue in excess of its six months' quota, and at the station producing the highest percentage of its quota in excess of assigned quota, the station manager and sales manager plus two employees in city offices and two in field offices (chosen by ballot of fellow employees) will get:

One week of additional vacation with pay and round-trip positive or revenue transportation for the employee and spouse (or one member of immediate family) to any point in the Western Hemisphere, plus \$200 cash for expenses.

Some of the highlights of the conference, which was conducted by Laigh Parker, vice president—traffic and sales:

- **Telephone Sales:** A 1954 goal is conversion of more phone inquiries into sales. A survey of one large office showed 35% of calls resulted in sales, 27% were inquiries about service, 38%

were reconfirmation, cancellations, etc. Otis Hardy, reservations manager, stated that one additional sale per 100 inquiries would mean 1000 more passengers and \$22,230 more revenue monthly; one sale per five inquiries would add 20,000 passengers and \$444,600. The latter figure is the goal.

- **On-Time Service:** Emphasis is to be placed on getting the airline on time and keeping it on time. Tom Miller, assistant vp-traffic and sales, heads an "on-time committee," established when it was discovered that on-time performance was deteriorating.

Items which the group expects to correct: unrealistic block-to-block speeds, inadequate ground times, tight turns on multiple-stop flights, not closing out flights in time, holding for late passengers from connections.

- **Priority Calendar:** Delta-C&S will try a "planning and priority calendar" this year. T. P. Delafield, general sales manager, said that by issuing such a calendar to all sales managers the general office hopes to cut down the amount of paperwork involved in sending out bulletins and instructions, avoid making conflicting demands on managers' time, and guide local offices away from overemphasis on a few phases of sales activity.

In January and February, for example, top attention throughout the system is being given to development of commercial business, with lower priority on conventions and winter vacations. Package vacations head the list for spring and summer.

- **Ticket Office Aids:** Projects accomplished or under way to make the sales job easier include:

- (1) publication of a new ticket office manual containing integrated policies and procedures of the two former systems;

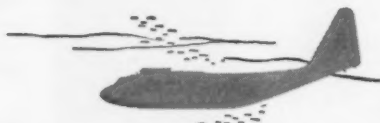
- (2) new check-in form eliminating the time-consuming process of reissuing tickets for overflowed passengers;

- (3) work in progress with the Scripto Co. of Atlanta on development of a ball point pen for ticket agents;

- (4) trials being conducted with the Burroughs ticketing machine (Ticketeer).

- **Air Travel Plan:** New idea to keep sales managers informed of traveling being done by Delta-C&S travel plan accounts in their cities was advanced by John Shad, passenger sales manager.

"When the accounting department makes up the statements for the individual accounts, they can be segregated by cities and the original forwarded to the sales manager concerned for review," he said. "Attached to each account's statement will be copies of transportation receipts signed when tickets



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are purchased. A check on these will give you the information you need as to the who, when and where of an account's use of competitive services and their general flow of travel."

After checking the receipts, each manager would mail the complete statement promptly to the subscriber. Shad asked managers to inform him in writing if they want this system on every-other-month basis.

• **Travel Agents:** Last year, Delta-C&S' 671 travel agents sold \$3,078,982 in on-line business, but of 10,000 package tours, 73% were sold in the company's own offices. Aim is for a big increase in percentage of vacation sales by agents without any decrease in company's own sales.

• **Conventions:** Development of convention business is to be stressed. Shad stated that in a recent month a minimum of \$20 revenue was secured for every phone or personal call made for convention business. "Is there any other type business we solicit that produces this rate?" he asked.

• **Cargo:** Express, mail, and freight have been producing almost 8½% of the company's revenue, or about \$45 million, according to John Pogue, cargo manager.

The company is now preparing new memo tariffs for each station, a new air freight manual is in the final stages, and every six months managers will receive IBM cargo statistics applicable to their stations.

• **Military:** Another '54 goal is more military business (1953 total was over \$3 million). Harold Salfen, military transportation director, pointed out a source often overlooked: over \$19 million was spent last year by the military on cost travel transportation requests—requests issued to individual soldiers who report to military districts without funds and with no means of reporting to their next stations.

Probably 90% of these TR's were issued for rail because airlines haven't told military offices about their services and costs, he added.

Although '54 will be a year of more aggressive selling, C. E. Woolman, president, closed the conference by putting equal emphasis on passenger service, courtesy and upholding the company's reputation.

"A corporation has character, ideals, and a reputation as much as an individual," he said. "A reputation takes a long time to build; one person can tear down part of it in two seconds. Our object is to make this the finest airline in the U.S.

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TO PROVIDE BETTER FACILITIES for its two Beech D-18S transports, the Anchor Hocking Glass Corp. bought an airport and put in new 3700-foot runway, 75 feet wide.

## Why Corporate Aircraft Owners Buy Airports

**Private fields are one way of securing adequate facilities when firms are in light traffic areas.**

By LOIS C. PHILMUS

**M**ANY potential corporate aircraft users, located in small towns, have been discouraged from buying aircraft by lack of airport facilities.

In such areas it is not economically feasible for either municipalities or private operators to run airfields because of light or almost non-existent air traffic. Several enterprising firms, however, have overcome the handicap, because of a great need for the use of their own aircraft, by buying and operating their own airports.

These companies not only provide landing and maintenance facilities for

their own operation, but wind up by providing public service to transient aircraft. End result has been a build-up in air traffic for the small community and greater convenience for industrial and business concerns located in the town.

The Anchor Hocking Glass Corp. and The Rynel Co. are two examples of corporate plane owners which maintain airports. Rynel took over the airport facilities in Sterling, Ill., over a year ago. After improvements financed by the company, the airport now has a more than adequate base for its three-plane fleet and visiting aircraft.

Recently the company's field received its CAA certificate.

Anchor Hocking Airport in Lancaster, Ohio, was bought in 1951 from a private operator because of the need for better facilities for the company's two Beech D-18S aircraft. Result is a much-improved airfield of benefit to Anchor Hocking, the R-B-M Company (Lancaster-based firm maintaining aircraft), transient aircraft, and the community at large.

Through the company's airport improvement program, the chamber of commerce is now negotiating to bring a feeder-airline service to the town.

The airport is run by Anchor Hocking's six-man aviation section, with James F. Kidd, chief pilot, doubling as airport manager. The company employs co-pilot/mechanics who, when



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not flying, service company and transient aircraft. All in all, a staff of six is responsible for keeping the Anchor Hocking planes flying and the airport running. There is someone on duty at the field at all times.

Improvements just completed: new 3700-foot runway, of which 3500 feet is hard surface asphalt. The 75-foot wide runway is serviced by an asphalt taxiway and parking area. In order to build the new runway, the company purchased additional acreage which brings the field size to 54 acres. New marker lights have been installed on both sides and ends of the runway.

A new hangar is now in service, which accommodates from four to six aircraft. An attached lean-to serves as office and waiting room. A beacon light was installed next to the hangar. On the roof is an illuminated wind cone. The name of the airport is illuminated by floodlights on the structure roof.

New construction at the field, officials feel, has brought it up to standards of non-carrier airports in larger communities. It can now accommodate any type of equipment in service with the business fleet today.

Transient aircraft can purchase either 80 or 91 octane aviation gasoline, a choice not available to the private operator two years ago. Landing fees for visiting aircraft are based on weight of aircraft. Single-engine planes pay no landing fees, but a parking fee, based on weight, is charged if the plane remains over an hour.

Further comforts have been provided by the Anchor Hocking management in the form of restaurant facilities. Space was leased to a private concern. Probably the proudest of the recent installations is the Unicom radio transmitter which operates on standard frequency.

The airport operation is hardly a profit-making affair at the moment, but cost is offset by convenience and indirect savings: without proper landing and maintenance space the company could not operate its fleet of aircraft, which have become as necessary as any machine in use in its plants.

Because of the success of this operation, as well as Rynel's, several other companies, similarly located in non-air traffic areas, are doing some intensive investigation with an eye toward duplicating the set-ups.

One point definitely proved by the "fleet-operating" airport managements is that simple, inexpensive facilities can be made available to the flying public without the million-dollar investments perpetrated in recent years. • • •

## Maintenance Bulletin Board



LOW-COST hot spray equipment built by Dual-Heet, Inc., serves as standby unit.

### Hot Sprays Help White-Top Connies

A system of hot-spray painting of the "white-top" aircraft finishes which are gaining wider acceptance among airlines in quest of cooler cabins has been successfully developed by Trans World Airlines.

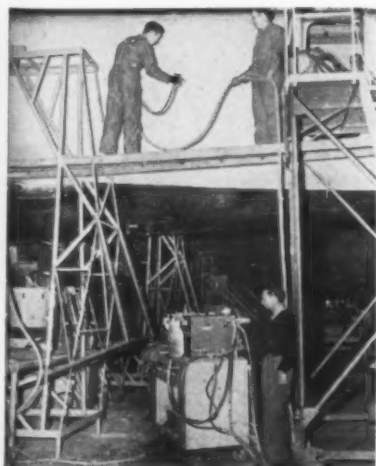
Results at TWA's Kansas City overhaul base to date show that the new method not only saves manpower and materials during the initial painting but that it also produces a more durable finish.

The idea of using the newer hot-

spray methods of painting belongs to Ed Hall, TWA paint shop foreman. Hall was faced with three major tasks in standardizing the airline's fleets, once the decision to go to the white-top had been made:

- Need for early rejuvenation of Lockheed 1049 aircraft received from the factory with the white enamel applied in the conventional manner;

- Fleet standardization of other Constellations. Only Lockheed 049 airplanes were not on the schedule, this



HEAVY-DUTY Bde unit (left) is demonstrated by Foreman Ed Hall. Portable Spec-flo equipment (right) is used for painting top surfaces of Constellations.



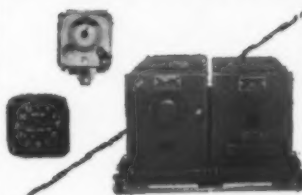
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due to the impact of the 45-50 pounds added by paint on this airplane.

• **Needed refinishing** of Martin C-0-2A aircraft to match the markings of newer 4-0-4 models—also for fleet standardization.

Following experimental use of hot enamel spray methods early in the program, Hall found its biggest advantage to be one not anticipated—it offered a new flexibility of scheduling for the paint operation for aircraft being processed through the base.

Instead of waiting for the completion of hangar work on an airplane and then scheduling added time for the white-top application, the hot spray method permitted application of the white enamel while the airplane was still in work.

Main reason was that the heated enamels, which do not require paint thinners, become dust-free in about 10 minutes. Conventional cold enamel applications would not become resistant to settling dust particles for two hours.

Other decided advantages:

• **Manpower - materials savings:** Without thinners, the heated enamel could be applied in a single coat thick enough to last between visits to the overhaul shop. This could not be done with conventional cold applications which required two coats, more paint and thinners, and greater hangar time allowance for painting.

• **Reduced overspray:** Heated enamels are applied at 45-50 psi pressures, whereas enamels with thinners require 80-85 psi. This means reduced fogging and overspray, resulting in a neater paint job with a minimum of waste.

After investigating available hot-spray equipment, Hall selected these models as best suiting TWA needs:

• **Bede Model VV:** A 24-28 gallon per hour capacity unit was picked for high volume work. It is built by Bede Products, Inc., of Cleveland, O., and sells for approximately \$700.

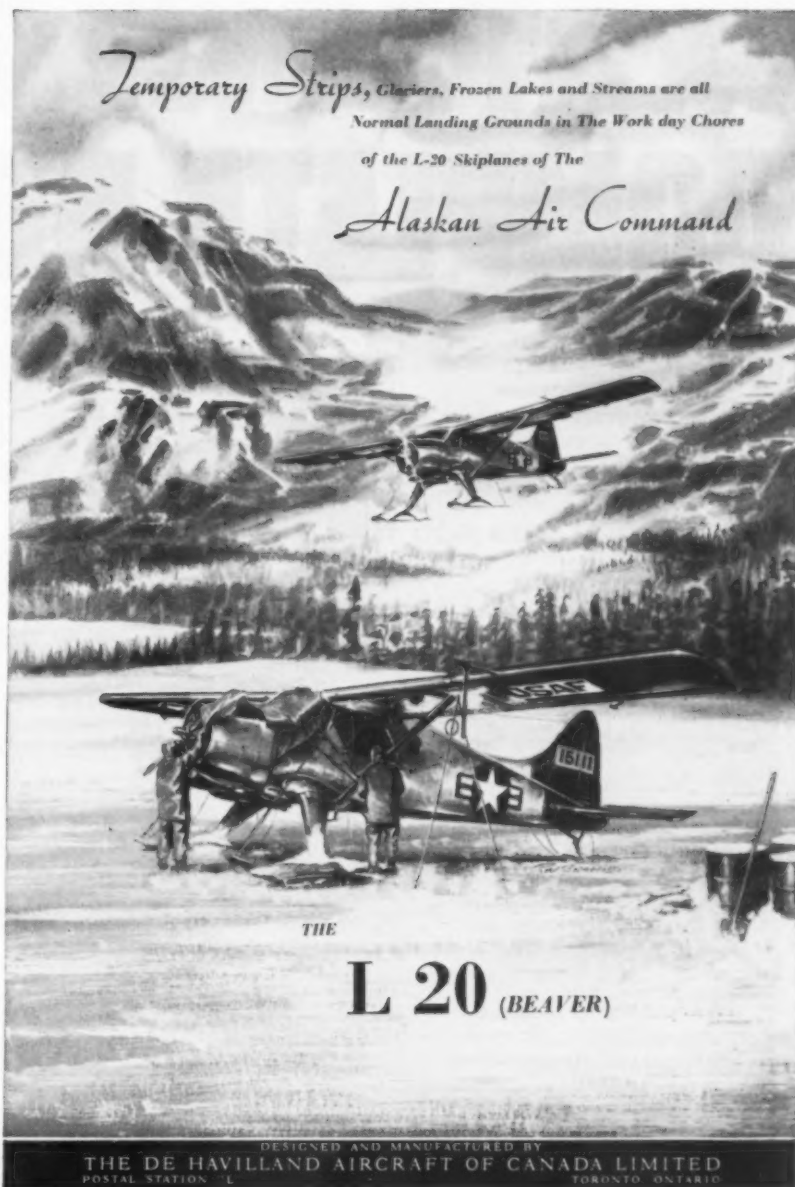
• **Spec-Flo Model 300-C:** Used for painting the fuselage top and other remote areas. Feature is its portability. Built by Spec-Flo Co. of Houston, Tex., it has a capacity of 7.5 gph and sells for about \$109.

• **Dual-Heet:** Chosen by Hall as a standby unit to the Bede equipment for work on large airplanes, this unit is priced at about \$350 and is built by Dual Heet, Inc., also of Cleveland.

• • •

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**AVC CHARACTERISTICS:** 3db variation with input varied from 5 to 100,000 microvolts for one watt output.  
**NOISE LIMITER:** Audio output variation not more than 2db from 70% modulation to 100% modulation.  
**SQUELCH:** Range 0 to 50 microvolts. On-off differential at 2 microvolts input level, 0.3 microvolts.  
**TEMPERATURE RANGE:** -25°C to +55°C.  
**HUMIDITY RANGE:** 0 to 95% at 50°C.  
**PRIMARY POWER:** 117 volts, 50/60-cycles ac, approximately 85 volt-amperes.  
**AUDIO OUTPUT IMPEDANCE:** 600-150-4 ohms.  
**R-F INPUT IMPEDANCE:** 52-ohm coaxial with maximum standing wave ratio of 2 to 1 from 118 to 136 mc.

## TRANSMITTER SPECIFICATIONS

**FREQUENCY RANGE:** 108 mc to 136 mc.  
**POWER OUTPUT:** 50 watts unmodulated.  
**EMISSION:** A3 (A.M. Telephony)  
**OUTPUT CIRCUIT:** To feed 52 ohm coaxial cable. Complete with antenna co-ax relay (send/rec.) installed.  
**MODULATION CAPABILITY:** 95% at 1000 cps.  
**NUMBER OF CHANNELS:** One. Can add crystal relay to give two channel operation. Second channel less than 800 kc away.  
**FREQUENCY STABILITY:** 0.005% from -25°C to +55°C.  
**AUDIO INPUT:** 500 ohm center tap or carbon mic. Minimum level approximately -15db into 500-ohm input.  
**AUDIO RESPONSE:** Within 6db from 300 to 4000 cycles.  
**DISTORTION:** 10% maximum at 95% modulation level (1000 cycles.)  
**NOISE LEVEL:** 40db below 95% modulation with 60-cycle supply.  
**INPUT POWER:** 117 volts, 50/60-cycles ac.  
**STANDBY:** 80 watts.  
**FULL OUTPUT**  
 (95% modulation): 380 watts.  
**TEMPERATURE RANGE:** With 866 mercury tubes 20°C to 55°C.  
 With 3B25 gas tubes -25°C to +55°C.

Write, wire or phone W. E. Cleaves, General Sales Manager, Bendix  
 Radio Communications, Baltimore 4, Maryland, or contact the  
 Bendix Sales office nearest you.



# Bendix Radio

DIVISION OF BENDIX AVIATION CORPORATION • BALTIMORE 4, MARYLAND

#### Export Sales:

Bendix International Division,  
 205 E. 42nd St., New York 17, N.Y., U.S.A.

#### West Coast Sales:

10500 Magnolia Blvd.  
 North Hollywood, California

#### Southwest Sales:

3300 Love Field Drive,  
 Dallas, Texas

\*REG. U. S. PAT. OFF.

Canadian Distributor: Aviation Electric, Ltd., 200 Laurentian Blvd., Montreal, Quebec

# STBENDIX RADIO OFFERS GROUND STATIONS!

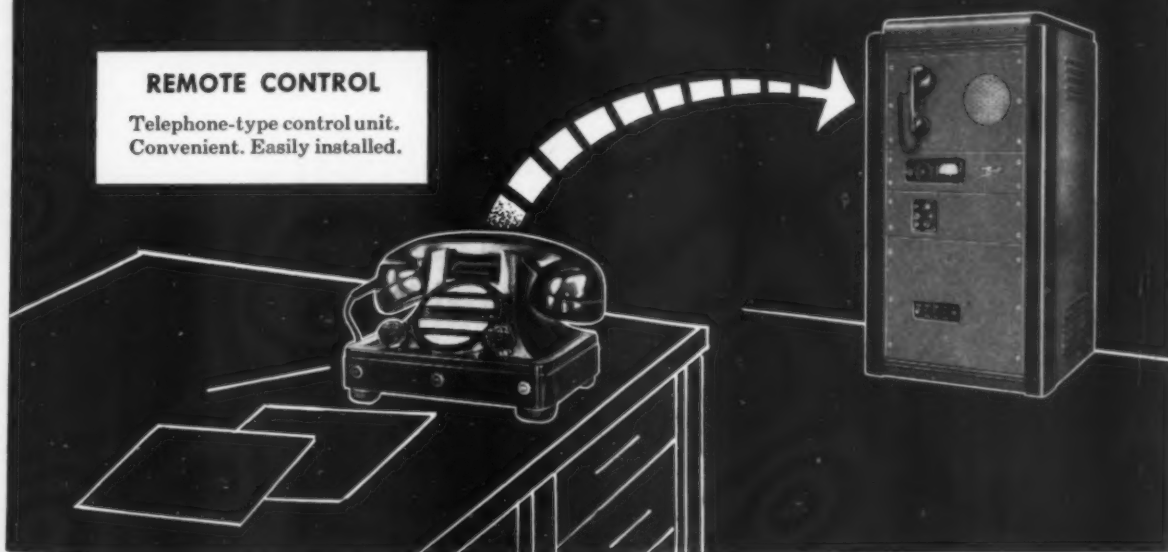
## LOCAL CONTROL

All controls easily accessible. Metal cabinet is 43" high, 18" deep and 22" wide.

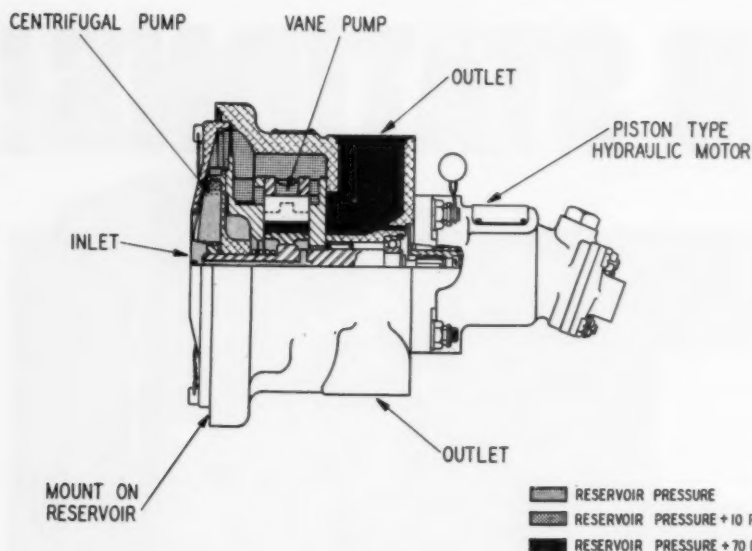


## REMOTE CONTROL

Telephone-type control unit. Convenient. Easily installed.



## New Products



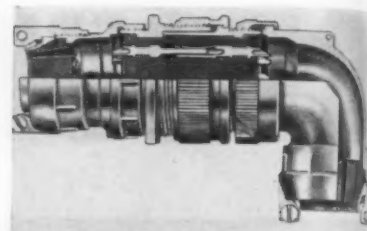
**Boost Pump.** Production of a new reservoir-mounted hydraulic boost pump for aircraft installations where system pumps are located a considerable distance from the reservoir has been announced by Vickers, Inc.

The arrangement uses a conventional Vickers 3000 psi MF-3906 hydraulic motor, along with the new AA 15500 boost pump. The combination weighs 9.1 pounds.

The new system provides reservoir oil under pressure to overcome line losses and assures an adequate supply of oil at the main pumps for efficient system operation, particularly where it is not necessary to pressurize the hydraulic reservoir.

Rating of the boost pump varies from five gallons per minute at a differential pressure of 100 psi to 35 gpm at 18 psi pressure.

Address: Vickers, Inc., Dept. AAP, 1400 Oakman Blvd., Detroit 32, Mich.



**Conductor.** Scintilla Magneto Division of Bendix Aviation Corp. has announced development of a new Type "E" environmental-resisting electrical connector that is designed to protect sensitive electronic circuits from thermal shock, surface condensation, and extreme vibration under high altitude flight conditions.

The new Scintilla connector is said to be the first approved under Spec. MIL-C-5015A. Its design stresses convenience of assembly—the space between insert and grommet providing ample working area for all assembly and soldering operations. Once assembled, individual wires can be removed and repaired with the connector in place.

Address: Scintilla Magneto Division, Bendix Aviation Corp., Dept. AAP, Sidney, N. Y.

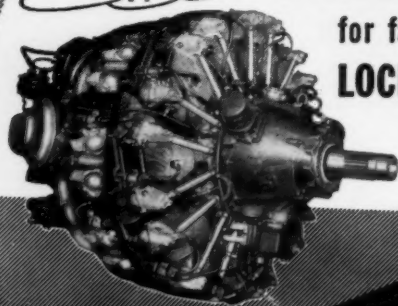
**Vacuum Switch.** An inexpensive vacuum switch recently introduced by Jaycon Associates acts as a circuit breaker or control by automatically disconnecting power from industrial or manufac-

24 LEADING WORLD AIRLINES HAVE SELECTED TURBO COMPOUNDS

**LAV** has selected

**TURBO COMPOUNDS**

for faster intercontinental service with  
**LOCKHEED Super CONSTELLATIONS**



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CORPORATION • WOOD-RIDGE, N. J.

*World's Finest Aircraft Engines*



SUMMERS

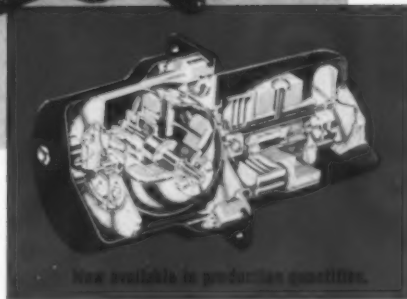
# PAR

## POSITION AND RATE GYRO

EXCELS AND OBSOLETES  
AN ENTIRE SERIES OF  
GUIDANCE ELEMENTS

Summers new PAR Gyro ends guidance headaches. Complicated automatic pilots are no longer necessary. Heretofore, position and rate signals were obtained by a position gyro and a separate rate unit; respectively, then algebraically added by a third unit. Summers integrating PAR Gyro provides position plus rate on a single pickoff. Possessing but one degree of freedom it avoids the complexity and limitations of multi-gimbal gyros. Unlimited maneuvering may be called for by applying an appropriate command voltage directly to the Summers single-gimbal PAR Gyro. Drift rates are in the order of 0.1 degree per minute.

Both weight and cost of the PAR Gyro are about one-fourth of the weight and cost of the apparatus it obsoletes.



Now available in production quantities.

Write for details on the PAR Gyro, or for information on Summers' facilities for developing and producing components and systems.

# SUMMERS

## GYROSCOPE

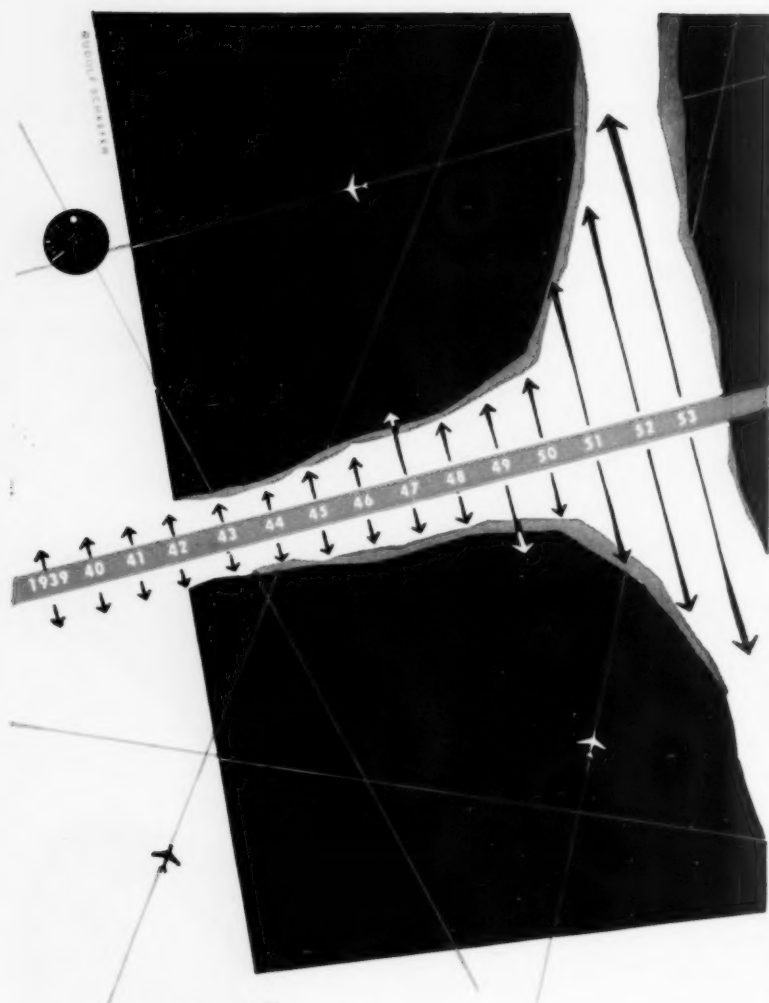
C O M P A N Y

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### REPRESENTATIVES:

H. A. Webb, 34 Mann Street, Fairborn, Ohio  
W. A. Laukaitis, Suite 724, Cafritz Building,  
1625 Eye Street N.W., Washington, D.C.  
George E. Harris & Co., Inc.,  
1734 No. Hillside, Wichita, Kansas

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## growth

Due to our long experience, the demand for our engineering services in designing new precision devices and systems has increased tremendously. Our activities now embrace the four distinct yet allied fields of

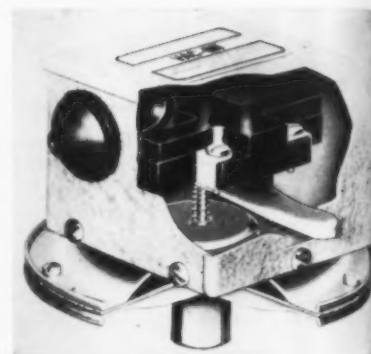
- ✧ AIRCRAFT INSTRUMENTS AND CONTROLS
- ✧ OPTICAL PARTS AND DEVICES
- ✧ MINIATURE AC MOTORS
- ✧ RADIO COMMUNICATIONS AND NAVIGATION EQUIPMENT

Current production is largely destined for our defense forces; but our research facilities, our skills and talents, are available to scientists seeking solutions to instrumentation and control problems.



**kollsman** INSTRUMENT CORP.

ELMHURST, NEW YORK • GLENDALE, CALIFORNIA • SUBSIDIARY OF *Standard* COIL PRODUCTS CO., INC.



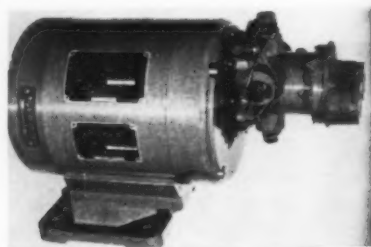
VACUUM SWITCH

turing equipment where the safety of operation depends on a suction-delivered liquid.

Operating on the spring-loading, rubber-diaphragm principle, the "Vac-on" switch, as it is called, mounts on the suction line and is wired into the power supply on electric motors or into the spark system on gasoline engines.

When suction falls below a predetermined negative pressure (approximately 1" Hg) the switch cuts off the motor or engine.

Address: Jaycon Associates, 404 N. Washington Ave., Minneapolis, Minn.



**Pump.** A new 3000-psi electric motor-driven hydraulic pump which weighs only 9.5 pounds and is rated for 0.5 gpm capacity flow has been introduced by Adel Division of General Metals Corp.

The Adel unit is designated Part No. 28430 and is intended for operation with MIL 5606 aircraft hydraulic fluid. The electric motor rating is 20 volts a-c, 400 cycle, 3-phase. Current draw at rated pressure and voltage is nine amperes. Overall pump and motor dimensions are L-8 3/4", M-5 5/8", and W-4".

Address: Adel Division of General Metals Corp., Dept. AAP, 10777 Van Owen St., Burbank, Calif.

### PHOTO CREDITS

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NORTH AMERICAN HAS BUILT MORE AIRPLANES THAN ANY OTHER COMPANY IN THE WORLD



## New Faster Fury Jet Joins Navy Air Team

Latest addition to North American's FJ series of Navy fighter aircraft will be the new FJ-3 Fury Jet, now in production. Powered by the Wright J-65 Sapphire jet engine, the FJ-3 is in the high subsonic speed class with faster rate of climb. Fitted with an improved Navy gun-sight and heavily armed, the Fury has a lethal punch rivaling any Navy carrier-based fighter.

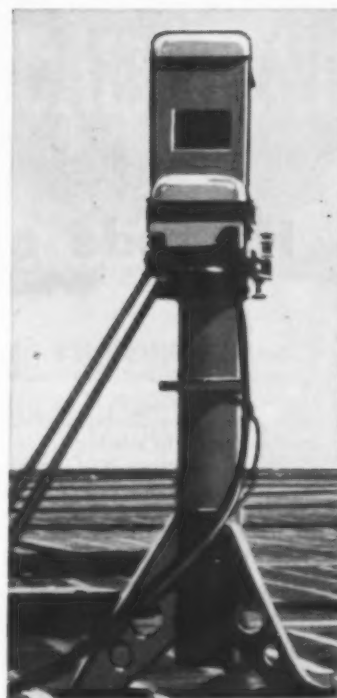
Sea-going sister to the battle-proven Sabre, the new FJ-3 Fury is another example of North American's engineering vision and ability in designing and building versatile... practical airplanes to protect our security everywhere.

organization, facilities and experience keep

**North American Aviation** years ahead

in aircraft...guided missiles...electronics...

atomic energy...research and development



Specially designed and built by North American for carrier suitability tests, TRODI is an electro-optical Touchdown Rate of Descent Indicator. Vital rate of descent data was formerly taken from photographs which took days to evaluate. Today, TRODI saves the Navy untold time, money and manpower by providing rate of descent information immediately upon the plane's landing.

PASSENGER COMFORT ASSURES REPEAT TRAFFIC



*Fresh as a Daisy!*

**He rode on an AEROTHERM Seat**

Refreshing relaxation is an inherent quality of Aerotherm's Model 366B-2 Double Passenger Seat. Cushioned with molded foam rubber of cored sections, the seat reclines to a relaxing 40° for day seating or to a full 70° slumberous recline for night resting.

Frame structure is of strong, lightweight magnesium and aluminum alloys for maximum weight holding capacity within load limits.

Aerotherm seats are designed for lightness, ample safety exceeding current load factors, and for luxurious comfort. They relax passengers . . . instill confidence in flying safety . . . make flying on your planes a habit.

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## People

### MANUFACTURING

**S. B. Withington**, a vice president of Avco Manufacturing Corp., has been named president of the newly consolidated Lycoming Division of the corporation. Other Lycoming Division officers recently appointed include: **Floyd J. Bird**, vice president and Williamsport plant manager; **Dr. Anselm Franz**, vice president, turbine engineering; **Clarence J. Mason**, controller; **James E. Mitchell**, vice president, industrial relations; **Arthur Nutt**, vice president, engineering; and **Donald F. Turner**, vice president and Bridgeport plant manager.

**Raymond C. Firestone** and **J. E. Trainer** have been elected executive vice presidents of The Firestone Tire & Rubber Co. Firestone has been vice president in charge of research and development since 1949, and Trainer has been vice president in charge of production since 1940.

**D. W. Brown** has been named manager of project engineering in the piloted aircraft engineering division of Goodyear Aircraft Corp., Akron, O. Brown's former position, manager of airframe installations design, has been taken over by **S. J. Pipitone**.

**Edward G. Conway** is the new works manager for The Kaman Aircraft Corp. Conway was formerly the helicopter company's production manager.

**Joel Ferrell** has been made manager of the Turbo-Jet branch of the Engine Test Facility at Arnold Engineering Development Center, Tullahoma, Tennessee.

**William A. Ready**, of Weston, Mass., has been elected to the board of directors of Browning Laboratories, Inc.

**G. S. Massa**, formerly vice president in charge of manufacturing at Hydro-Aire, Inc., has joined Com-Air Products, Inc., as vice president in charge of operations.



Massa



Ostrom

### AIRLINES

**Howard W. Ostrom** has been named sales manager of Mohawk Airlines, following the resignation of **Robert B. Forrest**, who is now with Caribbean Atlantic Airlines.

**Hans Dedekam** has been named by Scandinavian Airlines System to head its recently opened sales office in Montreal. Prior to his move to Montreal, Dedekam was executive assistant to the

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great services  
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MORNING AND EVENING  
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# WESTERN AIR LINES

America's Oldest Flies America's Newest



## GOODALL FABRICS

*fly with the finest* →

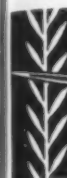
Major air lines, like all other branches of transportation, rely on Goodall Fabrics for the right balance of luxury and durability. Whether the need of commercial air lines is for upholstery, carpeting, draperies, or coated fabrics... Goodall meets their requirements in every way through the miracle of blending and diversification. For Goodall Fabrics are *Blended-to-Perform*...an investment in long-range economy and lasting beauty.

*Where Durability  
and Luxury  
are the keynote—  
GOODALL FABRICS  
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sales man  
Airways  
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President of SAS, Tore H. Nilbert.

Juan Homs, Jr., regional traffic and sales manager for Pan American World Airways in Lima for the past year, has been named sales manager of PAA's Latin American Division, with headquarters in Miami.

Robert T. Phinney is the new agency and interline sales manager for Braniff International Airways, replacing W. R. Beattie, who resigned to become general sales manager of Resort Airlines.

W. W. White has been named to the newly created post of staff superintendent-facility planning at United's operating base in Denver.



The following employees recently completed 20 years or more of service in the aviation industry:

• C. G. Adams, Braniff Airways. Secretary-treasurer, Dallas. 20 years.

• K. V. Beckle, United Air Lines. Flight engineer, San Francisco. 20 years.

• John A. Collings, Trans World Airlines. Executive vice president, New York. 25 years.

• John M. Koepf, Fairchild Engine and Airplane Corp. Process checker, Experimental shop, Farmingdale, N. Y. 23 years.

• Joe Stern, Fairchild Engine and Airplane Corp. Production engineering chief, operation sheet unit, Farmingdale, N. Y. 22 years.

• Ed White, Fairchild Engine and Airplane Corp. Experimental machine shop assistant foreman, Farmingdale, N. Y. 21 years.

• August Crist, Fairchild Engine and Airplane Corp. Experimental shop machinist, Farmingdale, N. Y. 21 years.

• E. W. Mueller, American Airlines. Ramp and airfreight chief, Ft. Worth. 20 years.

• G. E. Engleman, American Airlines. Flight dispatch assistant supervisor, Ft. Worth. 20 years.

• R. W. McDonald, American Airlines. Operations manager, Toronto. 20 years.

• L. G. Riley, American Airlines. Operations manager, Syracuse. 20 years.

• S. A. Benedetti, American Airlines. Power plant overhaul supervisor, Tulsa. 20 years.

• John J. Clark, Boeing Airplane Co. Project manager, B-47 Modification Center, Tucson. 20 years.

• H. L. Pabst, Eastern Air Lines, Captain, Miami. 25 years.

#### CORRECTION

Frederick G. Betts, 25-year man with Trans World Airlines, was improperly shown as asst director of purchasing in the January 18 issue. Correct title for Betts is system director of purchasing.

## When YOU want it...is your Plane

in the air  
or  
in the shop?



If your industrial airplane flies 600 hours a year, it probably spends a month in the shop undergoing routine inspections. Why keep an expensive investment unflyable so long?

No need to with Reading's one-day 50 and 100-hour inspection service. By appointment, you can bring in your Dove or D-18 in the morning and fly it away that afternoon. How? No short cuts; no hurrying—just the man power and engineered maintenance procedures for the most thorough inspection your aircraft ever had.

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### READING

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Municipal Airport • Reading, Pa.



For aircraft and special industrial applications

New fact-filled data folder gives quick help in selecting heavy duty structural latches. Design features flush mounting, self-closing, positive locking, extremely high strength in ratio to light weights; simple operation. For cargo doors, radomes, access panels and compartments; engine cowlings. Two-part construction. Can be operated without special tools. Special tail pieces and fittings available to meet customer requirements. No loose parts. Write for your copy.

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Portable Airline  
**OXYGEN UNITS**

CONSTANT FLOW Model 5500



Lightweight portable constant-flow supplementary oxygen for passengers or crew. Used with disposable or conventional re-breather mask.

DUAL PURPOSE Model 5600



Lightweight portable oxygen equipment with demand and constant flow outlets. Demand for smoke and fume protection of crew; constant flow for supplementary or therapeutic use of passengers or crew. Write today for complete information on both models!

Also fixed systems for airlines and corporate aircraft.



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Export: SOUTHERN OXYGEN CO.  
15 West 57th Street, New York 19, N. Y.





# AIRLINE COMMENTARY

• TRAFFIC • SALES • PUBLIC RELATIONS • by Eric Bramley

Airlines have been campaigning to change the name of New York International Airport to Idlewild. Seems there's been confusion among passengers—some of them think International and Idlewild are separate airports. The fact that the code for the field is IDL and that many airline employees describe it as "Idlewild" doesn't help. *Official Airline Guide* shows that U. S. lines generally use "International" in schedules, while some European carriers use "Idlewild". Eastern Air Lines blends them into International Idlewild Terminal. It's unlikely that the airline campaign will succeed: carriers therefore would do well to start giving uniform treatment to the field in their schedules and in conversations with passengers.

**Acceptance of air travel:** During his first year in office, President Eisenhower traveled 36,474 miles, as follows: air, 32,143 miles (over 88% of total); rail, 2,807; automobile, 1,149; ship, 375.

**Memo from a reader:** "On two occasions recently I noticed cigar smoking permitted in regular seats in DC-6's. One man smoked a pipe, then switched to cigars, and had a lighted cigar in hand on landing. Passengers weren't at all happy. Seems to be a loosening of discipline; results aren't good."

**A friend of ours wants to know** why airport hotels, such as Pittsburgh and those near Miami International, don't set aside some rooms that they'll rent by the hour. Would be useful to businessmen who want to hold conferences with local representatives or who want to catch a couple of hours sleep between planes, he points out. Sounds good. Hotels care to comment?

**Item from TWA Skyliner:** "A few months ago we inquired about a curious custom at the Kansas City overhaul base which involved painting the heels of certain TWAers red. Our inquiries drew a big and solid silence. Further research has unearthed the answer and reveals a natural reticence . . . to discuss the matter. Here it is: Whenever a TWAer stands too long in one spot, some friendly soul will sneak up in back of him and furtively paint the 'standee's' heels a bright red. Sort of a subtle hint on the part of his co-workers to 'keep moving, buddy.'"

Hats off to Charles Wilderman, American Airlines sales rep in Chicago, for his success in what must be one of the big one-man sales campaigns on record—he persuaded Sears Roebuck & Co. to sign an AA air travel plan contract. Sears has always avoided exclusive deals with airlines and, according to AA, has bought all its air transportation through a travel agency.

Wilderman's discussions with Sears extended over four months, during which

time other airlines also submitted proposals. Sears finally called a meeting of all carriers and announced it would accept the AA plan. In Chicago alone, Sears spends about \$500,000 yearly on air travel, with AA handling about one-fourth. There won't be any immediate change in the division of business, but AA points out happily that it will now be "in a closer relationship with Sears than any of its competitors in the area."

## Sales, Traffic, Promotion

About 17,000 male passengers rode United Air Lines' New York-Chicago "Executive" (men only) flights from last April, when service started, to end of 1953 (one round-trip daily) . . . Mohawk Airlines is putting top emphasis on passenger service. All airport and city ticket office personnel are attending, in weekly groups, a complete training program at Ithaca headquarters. Detailed exams are given at conclusion of training . . . Central Airlines has switched from stewards to stewardesses, with station personnel assuming more responsibility for loading and unloading cargo.

**New TWA promotions:** a series of jigsaw puzzles (pictures from TWA calendar) has been produced by Jaymar Specialty Co., New York. First run of 250,000 will be sold through major chain variety stores . . . Miniature cardboard replicas of TWA overnight bag, filled with candy, are being sold by Beich Candy Co., Bloomington, Ill. . . . One of Capital Airlines'

successful packages has been "Weekend at the Waldorf," which includes either two or three days at the New York hotel. Business concerns have been using packages as prizes in sales incentive contests.

Aer Lingus (Irish Air Lines) has installed "Reserveyor," automatic reservations system, in its Dublin office. System was invented, built and installed by Restrex Commercial Counting and Control Ltd., London . . . British European Airways has borrowed United Air Lines' M. L. Perry, telephone and ticket sales superintendent, and John Brinkman, payload control manager, to help with reservations and space control techniques.

Capital Airlines should reap dividends from recent familiarization tour which is conducted over part of its system for sales officials of seven European and two U. S. international carriers. Visiting the U. S. as Capital's guests, officials saw industries and other attractions in Cleveland, Detroit, Chicago, Pittsburgh and Washington.



**United Air Lines** mileage recorder at Denver base registers miles flown daily on system. It shows both plane and revenue passenger-miles on month-to-date basis, compared with previous year.



**New Delta-C&S** display has sea fan on plastic as background, hotels fashioned out of wire in foreground. Idea was originated by Burke Dowling Adams Inc., company's advertising agency.

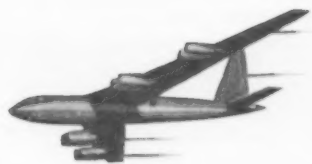


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# You can buy experience



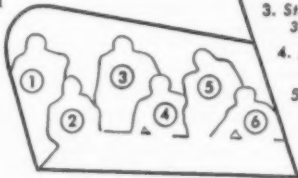
● Probably the outstanding characteristic of Twin Coach Aircraft Division plants is the wide *aircraft* experience of its personnel. This experience extends to all levels of the organization—from executive ... through supervision ... to production.

This means that prime contractors can entrust tooling design and construction to Twin ... can rely on Twin's producing assemblies to specification, in quantity, *on time*. Modern facilities, modern equipment and *experienced* manpower make Twin Coach a dependable source for every type of major airframe assembly.

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27 years
2. Stanley Lesinski  
38 years
3. Stephen Chojnacki  
38 years
4. John Lee  
36 years
5. John Mattison  
25 years
6. Harry Schaefer  
38 years



## TWIN COACH COMPANY

*Aircraft Division*

BUFFALO, N. Y.

### TWIN COACH PRODUCTS:

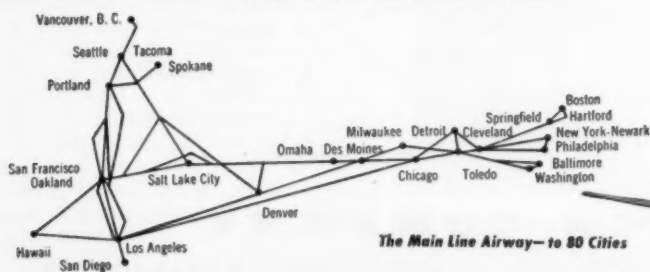
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Like going downstairs with your hand on the bannister



Your Mainliner has just landed after descending through a thick overcast. As you're about to leave the plane, you say to the Captain, "I don't see how you found your way through those clouds to the airport." He smiles. "Why, it's like coming downstairs with your hand on the bannister." He explains the Instrument Landing System. Electronic beams slant up from the runway at the correct angle for descent. Your Captain follows this "bannister" with instruments as simple to read as your car's speedometer. He emerges from the clouds in line with the runway—and uses his own keen eyesight to make the actual landing. Electronic equipment like this is one of the reasons why Mainliner® travel is now so popular in *all* seasons of the year!



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## North American Airlines Hearings Begin

Like a trial without a defendant, hearings in the controversial North American Airlines Enforcement Case finally began this month, but without the presence of the respondent—North American.

In a unique situation, CAB compliance attorneys Robert M. Johnson and John F. Wright presented their case unopposed against the combine of non-scheduled carriers and individuals connected with the organization. Exhibits, designed to support the enforcement case, were being received in evidence by Examiner William F. Cusick at the unheard of rate of 75 per day.

In the background was the position of North American's attorney Hardy K. Maclay that he should be granted a postponement of hearings due to a conflict with another CAB case in which he was participating. Maclay said he was the only attorney qualified to handle both cases. A formal postponement motion was pending Board action at press-time, but the hearings were well under way.

Last June, the hearings opened in Los Angeles but lasted only one hour

as Maclay brought a court action alleging CAB had no power to proceed with the hearings. A summer-long court fight ensued with CAB winning out in the fall.

Then a method designed to shorten the hearings was apparently agreed to. It involved the entering of stipulations on the record in lieu of oral presentations by witnesses.

But by mid-January, 1954, it was apparent this method was failing for lack of agreement and formal hearings were ordered to start on February 1 by Cusick.

Maclay asked Cusick for a postponement but was denied. He then appealed to the Board which has yet to act. In the interim he stayed away from the hearings which are now in progress.

The charge against the North American group is "knowing and willful" violations of the Act with outright revocation of each carrier's operating authority requested.

If Maclay fails to defend the case, the unopposed presentation of the Compliance Office will constitute the record on which CAB will act.

## PAA Suggests 3-Point Plan for Alaska

Pan American World Airways has suggested a "new aviation program" for Alaska which would eliminate "highly subsidized competition" and provide "greatly improved air service with new modern aircraft." Proposal was made by PAA vice president Alvin P. Adams at hearings in CAB's States-Alaska Case.

Claiming that the present "Alaska Experiment has failed," Adams said it has "cost the taxpayers \$7 million to find out that subsidized competition has not generated any new business or resulted in any improvement of the service."

Adams suggested a plan based on these three major points:

- Put PAA's DC-6B aircraft on the direct Seattle-Anchorage route to provide competition for the "one city in Alaska that can support it."

- Eliminate "expensive duplication" of PAA's services between the States and Juneau and Fairbanks.

- A merger of Pacific Northern and Alaska Airlines who now operate separate States-Alaska routes as well as interior Alaskan services.

At issue in the case are temporary States-Alaska certificates which remain in effect pending CAB decision and final ruling by President Eisenhower.

### CAB MISCELLANY

Southern Air Transport, a large irregular, has asked CAB for independent treatment of its applications in the Large Irregular Investigation.

Aerovias Sud Americana has applied for extension of its all-cargo route to Rio de Janeiro and Sao Paulo.

Allegheny Airlines applied for extension of its Pittsburgh-Philadelphia route to New York and Newark via

Trenton, N. J.

Alaska Airlines has asked CAB to approve a lower fare structure for its DC-4 aircraft between Seattle and Alaska than exists for Pan American's new DC-6B operation.

British Overseas Airways applied for amendment of its trans-Atlantic permit to add Chicago as a co-terminal with New York.

## CAB NEWS

### AS OF NOW . . .

The revised procedure limiting future presentations in the **Large Irregular Investigation** to "public interest" matters has resulted in an expedited hearing schedule. Los Angeles hearings, resumed February 10, are expected to be completed in two weeks instead of three to four months originally anticipated. Seattle hearings will start February 24, and the case will then move back to Washington. A tentative CAB decision is thus possible this summer. Under the old procedure, any kind of a CAB decision was at least two years away.

Unless the **Pioneer-Continental Merger Case** is greatly expedited it will overlap with a proceeding involving renewal of Pioneer's local service certificate which bears a September 30, 1954 expiration date.

Other local service renewal cases which should get under way this year involve **Trans-Texas, Southwest, and West Coast**. Each of their certificates expires in September.

Also up for renewal this year is the Chicago helicopter authorization granted in 1949 to **Helicopter Air Service, Inc.**, which bears a July 23, 1954, expiration date.

Already under way, but unlikely for decision at any foreseeable date are renewal cases involving (1) the **certificated all-cargo carriers** and (2) the **domestic freight forwarder industry**.

### RECENT CAB DECISIONS

- **Pioneer Air Lines** granted exemption permitting it to lease Martin 2-0-2 aircraft from its new subsidiary corporation, Pioneer Aeronautical Services, Inc.

- **Resort Airlines** authorized to suspend service temporarily at Guatemala City, Guatemala, and Merida, Mexico; application withheld from public disclosure.

- **Investigation of airlines' personal injury tariff rules** terminated, effective March 2, in view of new regulation eliminating need for filing such rules in future.

### CAB CALENDAR

**Feb. 16**—Oral argument before the Board in **Trans-Atlantic Cargo Case** (Seaboard & Western, et al.). Washington, D. C. Docket 3041.

**Feb. 16**—Hearing in **Reopened Latin American Freight Case**. Washington, D. C. Docket 2888 et al.

**Feb. 23**—Hearing in **Northeast Airlines Provincetown Service Case**. Washington, D. C. Docket 6204.

**Feb. 24**—Hearing resumed in **Large Irregular Air Carrier Investigation**. Seattle, Washington. Docket 5132 et al.

**Mar. 15**—Hearing in **Certificate Renewal Case**—Ellis Air Lines and Alaska Coastal Airlines. Tentative. Dockets 6264 & 6307.

**Mar. 17**—Hearing in **North Central Airlines Segment 5 Renewal Case**. Tentative. Docket 6432.

**Mar. 29**—Hearing in **Chicago-Detroit Local Service Investigation**. Tentative. Docket 6411 et al.



# U. S. INTERNATIONAL AIRLINE TRAFFIC FOR NOVEMBER, 1953

| AIRLINES  | REVENUE<br>PASSENGERS | REVENUE<br>PASSENGER<br>MILES | AVAILABLE<br>SEAT<br>MILES | PASSENGER<br>LOAD FACTOR | U. S. MAIL<br>TON-MAILS * | FOREIGN MAIL<br>TON-MAILS | EXPRESS<br>TON-MAILS | FREIGHT<br>TON-MAILS | TOTAL<br>TON-MAILS | REVENUE TRAFFIC | AVAILABLE<br>TON-MAILS | % AVAILABLE<br>TON-MAILS | REVENUE<br>PLANE-MILES | SCHEDULED<br>MILES | % SCHEDULED<br>MILES |
|---|-----------------------|-------------------------------|----------------------------|--------------------------|---------------------------|---------------------------|----------------------|----------------------|--------------------|-----------------|------------------------|--------------------------|------------------------|--------------------|----------------------|
| American  | 8,147                 | 5,982,000                     | 9,468,000                  | 63.18                    | 15,601                    | 4,882                     | 457                  | 230,694              | 897,187            | 1,415,619       | 63.38                  | 192,724                  | 183,744                | 100.00             |                      |
| Braniff   | 2,673                 | 6,063,000                     | 14,053,000                 | 43.14                    | 53,201                    | 7,609                     | ....                 | 79,324               | 823,518            | 1,414,344       | 44.53                  | 292,346                  | 292,424                | 99.97              |                      |
| Colonial  | 2,715                 | 2,108,000                     | 3,257,000                  | 64.72                    | 1,305                     | 546                       | ....                 | 5,764                | 236,090            | 525,243         | 44.93                  | 55,935                   | 48,100                 | 97.00              |                      |
| Delta-C&S   | 2,616                 | 2,963,000                     | 7,334,000                  | 40.40                    | 10,878                    | 1,241                     | ....                 | 117,022              | 439,612            | 1,007,595       | 43.63                  | 155,889                  | 159,517                | 97.73              |                      |
| Eastern   | 10,200                | 14,207,000                    | 26,891,000                 | 52.83                    | 59,109                    | ....                      | ....                 | 60,468               | 1,659,603          | 3,599,184       | 46.11                  | 445,429                  | 416,938                | 98.46              |                      |
| National  | 6,637                 | 3,238,000                     | 8,133,000                  | 40.34                    | 5,573                     | ....                      | 3,873                | 34,712               | 389,495            | 1,445,245       | 34.01                  | 139,694                  | 139,802                | 99.25              |                      |
| Northwest   | 5,420                 | 8,830,000                     | 19,340,000                 | 45.66                    | 101,412                   | 18,377                    | 12,551               | 524,132              | 1,616,165          | 2,796,208       | 57.80                  | 460,360                  | 478,510                | 95.65              |                      |
| Panagra   | 9,967                 | 11,684,000                    | 21,153,000                 | 55.24                    | 31,422                    | 29,471                    | ....                 | 248,889              | 1,625,998          | 2,827,684       | 57.50                  | 488,714                  | 475,043                | 99.22              |                      |
| Pan American  | 55,652                | 54,718,000                    | 94,405,000                 | 57.96                    | 244,947                   | 64,815                    | ....                 | 2,721,633            | 8,549,492          | 13,758,880      | 62.14                  | 2,153,436                | 2,024,571              | 96.76              |                      |
| Latin Amer.   | 39,640                | 47,097,000                    | 79,376,000                 | 59.33                    | 572,444                   | 136,442                   | ....                 | 1,255,902            | 6,984,388          | 10,800,565      | 64.67                  | 1,430,475                | 1,410,576              | 94.82              |                      |
| Pacific   | 6,915                 | 32,412,000                    | 53,100,000                 | 61.04                    | 353,085                   | 103,932                   | ....                 | 737,208              | 4,774,638          | 8,317,604       | 57.40                  | 977,764                  | 965,802                | 100.00             |                      |
| Alaska  | 3,652                 | 3,895,000                     | 9,372,000                  | 41.56                    | 30,270                    | ....                      | ....                 | 337,910              | 782,312            | 1,509,157       | 51.84                  | 240,309                  | 238,590                | 99.43              |                      |
| TWA   | 12,252                | 34,281,000                    | 58,896,000                 | 58.21                    | 413,077                   | 136,877                   | ....                 | 850,726              | 5,014,400          | 7,355,169       | 68.18                  | 1,270,857                | 1,286,448              | 97.04              |                      |
| United  | 4,134                 | 10,266,000                    | 16,693,000                 | 61.50                    | 86,436                    | ....                      | ....                 | 45,308               | 1,208,582          | 1,821,621       | 66.35                  | 300,694                  | 301,114                | 99.06              |                      |
| TOTALS  | 172,620               | 237,744,000                   | 421,471,000                | 56.41                    | 1,978,760                 | 504,192                   | 16,881               | 7,249,692            | 35,001,480         | 58,729,328      | 59.60                  | 8,604,626                | 8,413,179              | 97.41              |                      |
| * U.S. mail ton-mile figures include air parcel post.   |                       |                               |                            |                          |                           |                           |                      |                      |                    |                 |                        |                          |                        |                    |                      |
| NOTES:  |                       |                               |                            |                          |                           |                           |                      |                      |                    |                 |                        |                          |                        |                    |                      |
| 1. Above figures include both scheduled and non-scheduled operations.   |                       |                               |                            |                          |                           |                           |                      |                      |                    |                 |                        |                          |                        |                    |                      |
| 2. Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; Delta-C&S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to CAB, in accordance with CAB filing procedures. |                       |                               |                            |                          |                           |                           |                      |                      |                    |                 |                        |                          |                        |                    |                      |

# U. S. LOCAL SERVICE AIRLINE TRAFFIC FOR NOVEMBER, 1953

| AIRLINES   | REVENUE PASSENGERS | REVENUE PASSENGER MILES | AVAILABLE SEAT MILES | PASSENGER LOAD FACTOR % | MAIL TON-MAILS | EXPRESS TON-MAILS | FREIGHT TON-MAILS | TOTAL TON-MAILS | REVENUE TRAFFIC | AVAILABLE TON-MAILS | % AVAILABLE TON-MAILS | REVENUE PLANE-MILES | SCHEDULED MILES | % SCHEDULED MILES |
|--|--------------------|-------------------------|----------------------|-------------------------|----------------|-------------------|-------------------|-----------------|-----------------|---------------------|-----------------------|---------------------|-----------------|-------------------|
| Allegheny  | 16,297             | 2,508,000               | 6,765,000            | 37.07                   | 5,837          | 10,931            | • • • •           | 255,991         | 676,519         | 37.84               | 281,883               | 290,303             | 94.79           |                   |
| Bonanza  | 5,048              | 1,124,000               | 3,438,000            | 32.69                   | 1,627          | 1,078             | • 3,288           | 113,466         | 339,698         | 33.40               | 144,766               | 144,766             | 98.88           |                   |
| Braniff *  | 4,372              | 866,000                 | 1,918,000            | 45.15                   | 2,028          | 2,508             | • 2,597           | 89,636          | 191,822         | 46.73               | 79,926                | 80,838              | 98.57           |                   |
| Central  | 2,661              | 458,000                 | 2,995,000            | 15.29                   | 2,766          | 859               | • 3,087           | 46,569          | 247,708         | 18.30               | 158,748               | 161,550             | 98.27           |                   |
| Frontier   | 9,403              | 2,364,000               | 7,221,000            | 32.74                   | 6,564          | 5,183             | • 32,943          | 270,640         | 687,706         | 39.35               | 343,828               | 349,422             | 98.28           |                   |
| Lake Central   | 5,410              | 857,000                 | 3,583,000            | 23.92                   | 2,271          | 6,742             | • • • •           | 84,436          | 388,219         | 21.75               | 161,758               | 164,070             | 96.90           |                   |
| Mohawk   | 13,398             | 2,300,000               | 4,850,000            | 47.42                   | 2,757          | 8,384             | • 8,159           | 229,923         | 576,059         | 39.78               | 230,987               | 232,213             | 94.62           |                   |
| N. Central   | 17,483             | 3,077,000               | 7,443,000            | 41.34                   | 9,687          | 11,564            | • • • •           | 312,165         | 847,285         | 36.93               | 354,409               | 359,180             | 95.89           |                   |
| Ozark  | 12,552             | 1,979,000               | 6,673,000            | 29.66                   | 3,463          | 4,115             | • • • •           | 192,468         | 658,003         | 29.35               | 266,938               | 266,362             | 98.97           |                   |
| Piedmont   | 22,515             | 4,661,000               | 10,703,000           | 43.55                   | 8,020          | 7,800             | • 11,262          | 472,920         | 1,223,153       | 38.66               | 509,647               | 504,655             | 99.55           |                   |
| Pioneer  | 10,651             | 2,766,000               | 6,252,000            | 44.24                   | 7,735          | 3,147             | • 11,528          | 286,759         | 711,505         | 40.30               | 294,143               | 296,093             | 98.76           |                   |
| Southern   | 9,008              | 1,539,000               | 5,148,000            | 29.90                   | 5,529          | 4,969             | • • • •           | 157,691         | 557,792         | 28.27               | 245,130               | 247,697             | 98.70           |                   |
| Southwest  | 14,103             | 2,693,000               | 5,443,000            | 49.48                   | 5,226          | 3,730             | • 6,216           | 271,774         | 599,709         | 45.32               | 215,378               | 202,631             | 97.01           |                   |
| Trans-Texas  | 9,320              | 1,936,000               | 7,640,000            | 25.34                   | 7,614          | 3,642             | • 8,844           | 204,673         | 873,103         | 23.44               | 363,793               | 373,080             | 97.24           |                   |
| West Coast   | 11,346             | 2,180,000               | 6,395,000            | 34.09                   | 4,045          | 1,676             | • 2,677           | 208,554         | 520,193         | 40.09               | 278,979               | 285,720             | 96.45           |                   |
| TOTALS   | 164,367            | 31,308,000              | 86,467,000           | 36.21                   | 75,169         | 76,328            | 90,598            | 3,197,665       | 9,100,474       | 35.14               | 3,928,832             | 3,958,380           | 97.63           |                   |
| Helicopter Services  |                    |                         |                      |                         |                |                   |                   |                 |                 |                     |                       |                     |                 |                   |
| HAS  | • • • •            | • • • •                 | • • • •              | • • • •                 | 1,972          | • • • •           | • • • •           | 1,972           | 5,095           | 38.70               | 25,265                | 25,265              | 100.00          |                   |
| Los Angeles  | • • • •            | • • • •                 | • • • •              | • • • •                 | 4,156          | • • • •           | • • • •           | 4,156           | 11,277          | 36.85               | 24,417                | 24,417              | 92.69           |                   |
| N.Y.Airways  | 119                | 4,000                   | 28,000               | 14.29                   | 2,229          | • • • •           | 135               | 2,647           | 9,706           | 27.27               | 24,341                | 26,216              | 66.52           |                   |
| * Figures cover operations of local service route 106 operated by Braniff Airways as result of Braniff-TWA merger. |                    |                         |                      |                         |                |                   |                   |                 |                 |                     |                       |                     |                 |                   |
| NOTE: Above figures include both scheduled and non-scheduled operations.   |                    |                         |                      |                         |                |                   |                   |                 |                 |                     |                       |                     |                 |                   |

# ALASKAN AIRLINE TRAFFIC FOR SIX MONTHS ENDED JUNE 30, 1953

| AIRLINES   | REVENUE PASSENGERS | REVENUE PASSENGER MILES | AVAILABLE SEAT MILES | PASSENGER LOAD FACTOR % | MAIL TON-MAILS | EXPRESS TON-MAILS | FREIGHT TON-MAILS | TOTAL TON-MAILS | REVENUE TRAFFIC | AVAILABLE TON-MAILS | % AVAILABLE TON-MAILS | REVENUE PLANE-MILES | SCHEDULED MILES | % SCHEDULED MILES COMPLETED |
|--|--------------------|-------------------------|----------------------|-------------------------|----------------|-------------------|-------------------|-----------------|-----------------|---------------------|-----------------------|---------------------|-----------------|-----------------------------|
| Alaska *   | 14,050             | 7,844,000               | 33,242,000           | 23.60                   | 244,810        | 32,461            | 816,647           | 1,990,428       | 4,932,703       | 40.35               | 1,370,350             | 1,265,553           | 95.27           |                             |
| Alas. Coast.   | 15,790             | 1,454,000               | 2,651,000            | 54.85                   | 18,358         | 8,387             | 11,200            | 171,375         | 325,747         | 52.61               | 349,152               | 275,043             | 90.26           |                             |
| Byers  | 455                | 45,000                  | 116,000              | 38.79                   | 2,881          | ...               | 3,874             | 11,841          | 19,520          | 60.66               | 45,758                | 29,776              | 100.00          |                             |
| Cordova  | 4,189              | 474,000                 | 1,706,000            | 27.78                   | 9,094          | ...               | 7,911             | 65,170          | 177,668         | 36.68               | 190,746               | 157,514             | 88.13           |                             |
| Ellis  | 18,632             | 1,057,000               | 1,973,000            | 55.09                   | 8,003          | 11,249            | ...               | 129,601         | 202,693         | 63.94               | 276,577               | 174,319             | 93.84           |                             |
| N. Consol.   | 7,683              | 1,907,000               | 5,553,000            | 34.34                   | 102,320        | 2,683             | 146,166           | 454,607         | 872,727         | 52.09               | 630,970               | 487,477             | 91.93           |                             |
| Pac. North.  | 32,168             | 24,104,000              | 48,248,000           | 49.96                   | 291,968        | ...               | 1,195,972         | 4,070,367       | 6,743,869       | 60.36               | 1,478,120             | 1,409,244           | 97.13           |                             |
| Reeve  | 1,454              | 929,000                 | 2,504,000            | 37.10                   | 45,529         | ...               | 136,743           | 289,416         | 505,560         | 57.25               | 252,120               | 150,868             | 100.00          |                             |
| Wien Alaska  | 4,823              | 1,439,000               | 4,765,000            | 30.20                   | 120,813        | 3,293             | 186,844           | 461,427         | 1,006,791       | 45.83               | 665,834               | 468,701             | 90.22           |                             |
| TOTALS   | 99,244             | 39,283,000              | 100,758,000          | 38.99                   | 844,276        | 58,073            | 2,505,057         | 7,644,232       | 14,787,278      | 51.69               | 5,259,627             | 4,418,495           | 94.51           |                             |
| * Figures include both U.S.-Alaska and intra-Alaska operations. ** Figures include both Alaskan and overseas operations. |                    |                         |                      |                         |                |                   |                   |                 |                 |                     |                       |                     |                 |                             |
| NOTE: Above figures include both scheduled and non-scheduled operations.   |                    |                         |                      |                         |                |                   |                   |                 |                 |                     |                       |                     |                 |                             |





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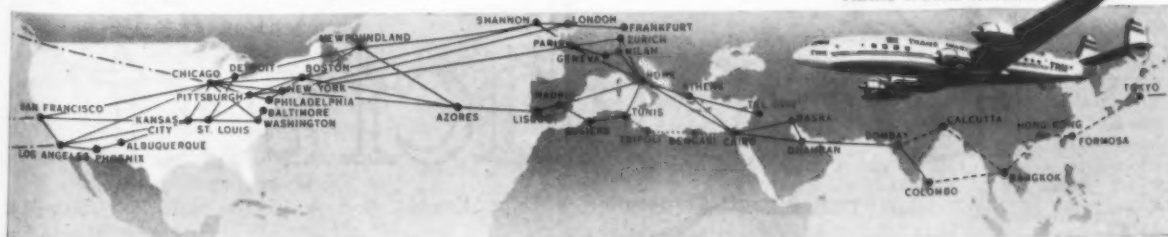
Even on the ground, this graceful Skyliner seems poised in flight. And in the air, it's the pilot's dream, the passengers' delight. Such an easy-going feeling of speed and dependability. Such luxurious accommodations throughout. So much more room to walk around in that it actually surprises you. Yes, no wonder TWA Constellations have become the symbol of the finest in air travel... the first choice of the world's most experienced travelers.



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## tested and PROVED

Recently at Air Force Flight Test Center, Edwards Air Force Base, a Beechcraft designed and produced T-34A trainer completed important flight testing during which 434 flying hours were logged in 32 days. So far as is known, this is the shortest length of time on record used to complete such tests — all the more to the credit of both the Beechcraft T-34A Mentor and the military test crews.

As a part of that testing, one USAF T-34A was flown continuously for a 24-hour period with

only 40 minutes out for seven landings to take on fuel. The seven "pit-checks" averaged out to 5 minutes and 42 seconds each — a tribute to the plane, its pilots, and the ground crews.

The performance-record was not just a "stunt" — it was carried out in the functional development part of the series of tests all USAF aircraft must go through in order to become an accepted part of the nation's air defenses; it was carried out to know if the T-34A could stand up under a round-the-clock training program.

The Beechcraft T-34A trainer is now in production for the U. S. A. F. and the military services of friendly foreign governments.



# Beechcraft

Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

Beech Builds: USAF T-34A • USAF L-23A • USAF C-45H • USN SNB-5 • Model 35 Bonanza • Model 50 Twin-Bonanza • Model 18 Executive Transport



## INTERCOM

End of another chapter in the sad saga of an aircraft which once seemed to have the brightest of futures came recently when West African Airways decided to sell its six Handley Page/Miles Marathon four-engine transports after less than two years of service. Due to a variety of technical troubles some of these 18-passenger planes have flown only 350 hours and the greatest time logged by any of the six is 1250 hours. The only other airline operating Marathons is Union of Burma Airways, which bought four.

The Marathon first flew in May 1946 and it emerged from its official trials with one of the best flight test reports ever published. The British government then ordered 40 with the idea of selling them to British European Airways and various airlines overseas. But in 1948 the Miles company went into liquidation and subsequently Handley Page took over the Marathon contract. Production was delayed and BEA decided to satisfy its domestic service requirements by buying additional DC-3's. Then the de Havilland Heron appeared on the scene as a plane that could do virtually all the Marathon could but was cheaper to buy and more economical to operate. The bottom fell out of the Marathon market and eventually the RAF took over the 30 unsold planes.

Far better than the average detective story are some of the foreign airline accident investigation reports contained in the latest issue (No. 4) of ICAO's Aircraft Accident Digest. One relates how the unclamping of a link cheek of a chain in the co-pilot's control column caused the blocking of the aircraft's ailerons immediately after take-off; the crash killed all the 38 occupants. Another report tells how the cause of a casualty-free emergency landing of a transport was traced to the disconnecting of the articulated control rod of the propeller governor due to (1) the lack of a cotter pin on the governor spindle and (2) to the nut of the control spindle's ball-joint having been unscrewed by force. The ICAO publication contains summaries of 47 U. S. and foreign accident reports involving commercial transports.

## NATO Studies Lightweight Fighters

Plans to re-equip some of the North Atlantic Treaty Organization air forces with lightweight British and French fighters are being studied at NATO headquarters near Paris.

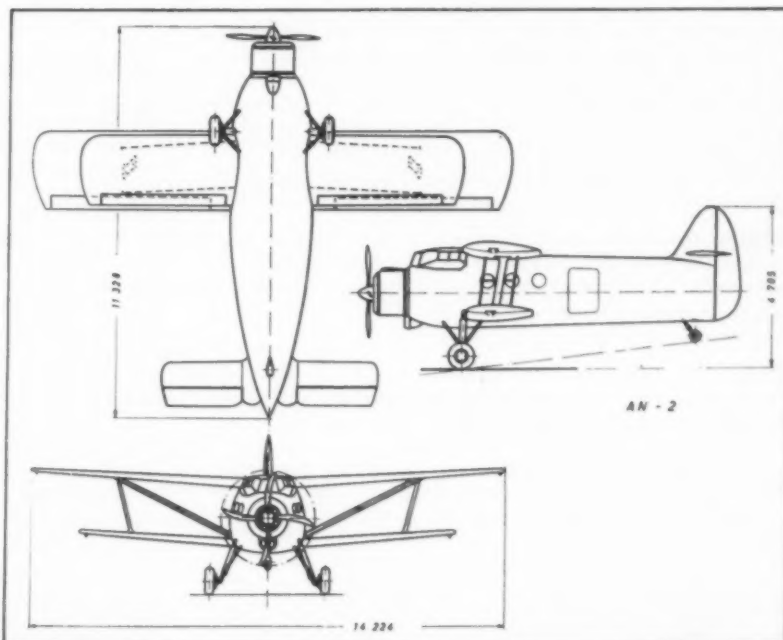
The program would probably involve using the Folland Gnat for high-level interception and the SNCASE Baroudeur for tactical support missions. Both planes are private ventures, but their development has been viewed with approval by both the British and French governments (the latter recently ordered a small quantity of Baroudeurs).

One of the principal reasons for the interest in lightweight fighters is their low cost. A full NATO wing of 75 Gnats, for example, would run only about \$7 million against some \$30 million for normal fighter aircraft. Per-

formance of the Gnat, powered by a Bristol Saturn, is likely to surpass that of more complex types in similar state of development.

An argument in favor of the Baroudeur is its independence of hard-surfaced runways or even of prepared airfields. It takes off with a run of about 2000 feet due to the use of a rocket-boosted trolley and thus can use any of the hundreds of abandoned grass airfields scattered all over Western Europe.

Perhaps the most compelling of all arguments in favor of the lightweight fighters for NATO use is the doubt whether in wartime any nation can produce a sufficient number of skilled man-hours of work to make good wastage of "normal" complex types.



**Latest Russian general purpose aircraft** is the Antonov AN-2, which may be compared in performance and purpose to the de Havilland-Canada Otter. Despite its obsolete appearance the AN-2 was designed after the war, in 1947, but only recently entered large-scale production. The two main uses to which the all-metal biplane is put in Russia are transport in areas where airfield facilities are restricted and the training of civil parachutists. It can use skis, floats, or a conventional wheel landing gear. Powered by a 760-hp seven-cylinder ASch-2 radial, the AN-2 has a gross weight of about 8800 pounds and a maximum speed of 185 mph. Wing span is 47 feet; length, 36 feet; and height, 16 feet. Up to 14 passengers may be carried.

# INTERNATIONAL AVIATION

## MILITARY

**FRANCE:** SNCASE Baroudeur interceptor prototype has been flown with its detachable undercarriage attached and has also taken off using only its landing skids. French government has placed a pre-production order for "less than 10" Baroudeurs. Plane will soon be demonstrated in Switzerland.

**INDIA:** Hindustan Aircraft, Bangalore, is producing the HT-2 trainer at the rate of 60 a year, but this could be doubled if required. Company hopes to export the plane when domestic demand has been filled. Price is about \$16,000.

**NORWAY:** Two Bell 47G helicopters will be taken into operation by the Norwegian Air Force early this year.

**NETHERLANDS:** First batch of Lockheed P2V patrol aircraft for the naval air service have been delivered. Two squadrons are to be equipped with these planes.

**NATO:** Swedish Bofors Model 1948 40-mm has been adopted as the standard light anti-aircraft cannon. It fires at 250 to 300 rounds per minute and has a muzzle velocity of 3250 feet per second.

## AIRLINES

**GERMANY:** The Convair 340 which was to have been delivered to Luftag last month has been sold to Union Carbide and Carbon Corp. by agreement with the German airline authorities. Germany is still forbidden to import or operate aircraft. On order for the German airline are four 340's and four Super Connies. Former were originally scheduled to be used for inaugurating European operations this summer; latter are due for delivery early next year.

**SPAIN:** Iberia plans to start service to New York in July or August. Super Constellations with first and tourist accommodations will fly the New York-Madrid route with an initial frequency of once weekly. First of the three planes will be delivered in June.

**PAKISTAN:** Pakistan International Airways has taken delivery of its first (of three) Super Constellations and plans to begin operations on May 1, initially between Karachi and Dacca, Eastern Pakistan, and subsequently Karachi-London with one stop only (at Damascus.) KLM is assisting in PIA's training program. Pakistani domestic carrier Orient Airways is to be absorbed into the government-controlled PIA.



FRANCE'S SFECMAS 1402 (left) recently started its flight test program. The experimental plane is powered by a SNECMA Atar 101B. Another French delta, the Payen PA 49 (right) flew for the first time a few days after the 1402.

**GREECE:** TAE National Greek Airlines is to be liquidated and the operation of Greek domestic and international routes will be turned over to a private company on a management contract basis. Several Greek and foreign companies (including Transocean Air Lines) have submitted proposals to the Greek government. Operations to New York and to Western Europe are envisaged.

**NORWAY:** In a bid to continue operations to the Far East after its license expires on March 31, Braathens SAFE is seeking to operate a combination freight/passenger service over its present route. It claims that this service would not compete with Scandinavian Airlines System's route to the Orient since it would be predominately a freight operation with passenger capacity restricted to about 10 or 12 seats.

**SOVIET UNION:** A full interline agreement has been concluded between Aeroflot and SAS. The two carriers will step up their Leningrad-Helsinki and Stockholm-Helsinki services, respectively, to six flights weekly, thereby providing a through connection between Scandinavia and Russia each weekday. Aeroflot can also sell tickets against payment in roubles to any point on the SAS system and SAS can sell tickets to points served by Aeroflot.

## MANUFACTURING

**CANADA:** All F-86 fighters in production at Canadair, Ltd. are now equipped with a new "hard leading edge" wing for increased performance at altitude. The extended leading edge makes the wing six inches wider at the fuselage and three inches wider at the tip.

**BRITAIN:** The prototype Vickers Viscount 700 recently tested the new Varley starter batteries in cold weather. Since an ordinary car battery is not powerful enough to give rapid spin for turboprops, diesel-electric Murex ground trucks are stationed at landing points on Viscount routes. But for a charter operator, like Norway's Fred Olsen, the aircraft must be capable of being started without external aid.

**FRANCE:** SNCASO 1221 Djinn has set a world altitude record for helicopters of less than 1100 pounds by reaching 15,550 feet. Company is currently building a batch of 10 Djinn's. SNCASO plans to use two Turbomeca Palouste compressors to power a development of the Djinn, and thus obtain a rotorcraft with a disposable load equal to or superior to that of the Bell 47.





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photographs of his native New Zealand  
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much data on the country.

... WWP

**NUCLEAR PHYSICS** by W. Heiser-  
berg. Philosophical Library, 15 East  
40 Street, New York City. \$4.75;  
225 pp.

This compact little book by the  
director of the Max Planck Institute  
of Physics in Göttingen, Germany, is  
designed as an introduction to the sub-  
ject for the educated layman who has  
not been scientifically trained. Clearly  
written, with a minimum of formulae,  
it offers a survey of the history of con-  
cepts of the atom, various types of  
nuclear reactions, the means by which  
they are studied, and some of the recent  
applications.

In a field which is expanding daily,  
and in which so much information is  
still secret, this book cannot and does  
not make any claim to being an up-to-  
the-minute report on atomic energy.  
It is, instead, a source of the funda-  
mental information which is needed by  
the newspaper or magazine reader in  
order that the latest news may be  
understood.

Included in an appendix is an  
account of German work on nuclear  
energy during the war years, in which  
the author relates how allied air raids  
played a major role in slowing develop-  
ment of a nuclear reactor virtually to  
a stand-still.

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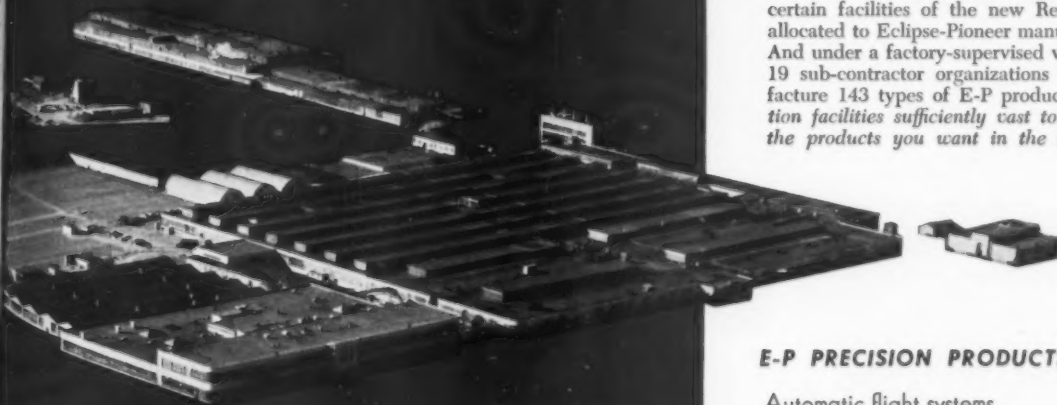
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WAYNE W. PARRISH

**Paris Weekend.** It was a grey damp, cold weekend in Paris last November. Our Air France party had arrived early Saturday afternoon and was to leave early Monday morning for Algiers. You can almost count it as a certainty that all press parties arrive in Paris when the stores are about to close and leave before they open.

But I had lots to do besides shopping. And on Sunday afternoon, as I've done before, I arrived at **Bob Kinhead's** apartment for what we shall call tea. Bob is head man for Republic Aviation Corp. over there and he and his wife **Marge** are delightful hosts. Following this came dinner at La Cremalliere, one of Paris' very top places for good food and which I had never been to before.

Somehow or other, but not exactly unexpectedly, I found myself with a friend after dinner over on the left bank looking for a new place to discover. Driving around near the famous church of St. Germain-des-Pres, I spotted an inconspicuous lighted sign reading Club St. Germain-des-Pres at 13 rue St. Benoit. Was this predestined? I had a sudden urge to go in. Without the slightest hesitation, and not having the vaguest idea of what we might find, we quickly parked the car and went to the entrance.

**Sensuous Plus.** It was a club in name only. Pay a few francs at the entrance, sign your name, receive a card, and you're a member. Down a long flight of stone steps we went into a large vaulted cellar or series of cellars and in the dimly lighted interior we found a table in a corner. The air was heavy with tobacco smoke. A waiter brought a wine list and I found the prices to be surprisingly inexpensive. By all Paris standards they were dirt cheap. This was no tourist trap. In fact we were the only ones in the place who had the appearance of outsiders.

I'm no fan of jive or whatever the youngsters call hot music these days. But I'm here to bear witness that in this joint I finally realized what is really meant by sensuous music. No brass. No jumping around like maniacs. This was all deadly serious, minus smiles. This was the home of perfectionists, the cultists, of an advanced rhythm. Mostly piano, helped by a double bass.

**Mixed Company.** How can I really describe this place in the bowels of Paris? Through the haze I noted that quite a portion of the patrons consisted of Negro girls paired with white guys and Negro men paired with white



YE ED is finding this world to be full of pleasant surprises, one of the very nicest being pictured above. As you can see, it's a propeller blade fashioned into a big pen and mounted on a heavy base. The whole thing must weigh half a ton. The engraved inscription reads "To Wayne W. Parrish, a Pen Worthy of His Words from His Friends at Curtiss-Wright." The gag of trying to write a check with the pen was dreamed up by aviation's popular photographer in Washington, Del Ankers. That's Ye Ed's Girl Friday, Kay Charlton, pouring the ink. This all started because Ye Ed made a couple of speeches before the management club at C-W's Propeller Division. The Curtiss-Wright boys worked hard on machining this big project and flew it down to Washington in the company C-46. Believe me, it makes a guy feel mighty awful humble to get something like this. So, to all my many friends at Curtiss-Wright, thanks many millions. I hope I can merit such a tribute.

girls. Some of the other patrons were strictly odd characters. It was a truly international and racial assortment of human beings finding an outlet in music which became tantalizingly, unconsciously, promisingly, unrelentingly sensuous as it reached Bolero-like climaxes. As the evening wore on, the dancing became quite warm, too. Not exactly the place for Aunt Nellie.

I don't pretend that I understand what it was all about. All I do know is that it wasn't frivolous like a school boy's jive antics and that the rhythm became increasingly irresistible despite my initial reluctance to like it. It was only hours later when I climbed out into the cold air of an early winter morning in Paris that the gripping bonds were broken, as at the end of a weird spell or a fantastic dream. Through the empty streets we drove back to the George V Hotel to reject the kind of civilization I know and understand.

**Up and Up.** It was at an early hour when the phone rang telling me it was time to get up and pack and pile into a car for Le Bourget Airport. The weather remained grey, damp and cold. We were to board an Air France Comet I for Algiers.

In no time at all, it seemed, our party was on the Comet, the jet engines were started, we taxied to the end of the long runway and off we went into the low ceiling and out on top into the sunlight which the people of Paris hadn't seen in quite a few weeks.

Up to 38,000 feet we soared, heading due South, and it seemed only a short while before I spotted the Swiss Alps off to the east and shortly after that the Pyrenees off to our right and down below was the coast of Spain and in the distance off our right was the big city of Barcelona. Now we were flying over those pleasant Balearic Islands in the Mediterranean, which now serve as markers for letdown procedures for Algiers in North Africa.

**Algerian Sun.** Such is the miracle of high altitude jet flying that just two hours and fifteen minutes, or about 850 miles, from wintry Paris we circled over the eastern section of Algiers with its massive globs of white buildings and came in for a smooth landing in this land of Arabs and camels and date palms and a very thriving, prosperous French agricultural and industrial economy.

The sun felt good. We were well received by a local delegation. It was my second visit to North Africa for the year, but it was to be quite unlike the earlier trip to the international zone of Tangier.

We were taken to the St. George Hotel in the center of the city. With good roads, lots of traffic, busy city streets, a big business section, a great deal of activity and bustle, Algiers is a big sprawling French city with a large Arab population. It is no tourist resort, it's an industrial center, a vital port, and the center of a vast trade area.

After getting into our rooms it was time for lunch. And after lunch we were to visit the Casbah. Yep, the real Casbah. That'll be in the next installment, folks, and then come the Arab dancing girls in the Sahara. Ah, this suspense. It's killin' me. What's it doin' to you?



## FACTS ABOUT



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The Lear-Romec pump illustrated is a submerged turbine-type water utility pump. It is one of a series available in AC and DC motor drive, originally developed for military aircraft, and produced by Lear-Romec for the past ten years. Weighs 2.8 pounds less than equivalent model vane-type pumps. Similar turbine type pumps are also furnished by Lear-Romec for aircraft engine water injection systems.

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FEBRUAR

# News at Deadline

## North American Reports Earnings Up in Quarter

Earnings reported by North American Aviation reached \$2.78 million for the three months ended December 31, up from \$2.4 million for the similar period in 1952. The firm reports that it does not expect the sales or earnings for the fiscal year to show any effect from a 54 day strike.

Backlog on December 31 amounted to \$1.03 billion. Three months earlier the figure had stood at \$958 million. During the last quarter the company received new business amounting to \$191.6 million and made shipments valued at \$117.9 million.

## AF Accepts First F-89D Production Simulator

The Air Force has accepted the first production flight simulator of the Northrop F-89D all-weather interceptor from Link Aviation, Inc. The prototype of the simulator is in operation at Moody AFB, Ga. The unit is described as the "newest and most fully equipped jet training device developed in the synthetic training field." Link is also developing a Convair F-102 flight simulator for the USAF.

As part of ceremonies celebrating the 25th year of simulated flight, Air Force Secretary Harold E. Talbott presented Edward A. Link, chairman of the firm, with the USAF Exceptional Service Award in recognition of his pioneering accomplishments in the simulator field.

## Cook to Leave Materiel Command for Europe

New deputy commander in chief of the U. S. European Command is to be Lt. Gen. Orval R. Cook, present deputy chief of staff/materiel. Cook has also been nominated to the rank of full general as one of a number of top level shifts in the Air Force included in President Eisenhower's nominations to the Senate.

Cook was last fall given special authority over the Air Materiel Command and the Air Research and Development Command. He is to be succeeded in that post by Lt. Gen. Bryant L. Boatner, now AF inspector general.

In his European assignment Cook will succeed Gen. T. T. Handy, who is retiring.

## First Class Mail Tests To Be Extended in East

Extension of first class mail experiments to the New York-Miami and Chicago-Miami routes has been announced by the Post Office Department. Eastern Air Lines and National Airlines will participate in the east coast flights, with Eastern and Delta-C&S handling Chicago-Florida mail.

Intermediate stops between New York and Miami will include Washington, Jacksonville, and Tampa, with the latter two also included on Chicago-Miami. This will mark the first time that intermediates have been included in trunkline experiments.

The PO hopes to start the flights by February 15 if CAB acts on its petition in time.

## Service Rate May Still Contain Subsidy: PO

The Post Office believes that air mail rates may still be too high, according to the testimony of Postmaster General Arthur E. Summerfield before the Treasury-Post Office subcommittee of the House Appropriations Committee.

Discussing the transfer of \$79.5 million in subsidy from the PO to the CAB, Summerfield referred to "that part which may still be subsidy in the prevailing service rate." He had remarked earlier: "It is our feeling now that the subsidy matter will come under the scrutiny of this committee and the Congress, and that it will mean a savings to the taxpayers in the future."

## CAA Would Revise Communications Net

Proposed revisions in the aeronautical communications network would save \$1 million annually, according to a program revealed by Fred Lee, CAA Administrator. The program would involve the discontinuance of 37 interstate airways communications stations. At present there are 435.

Before any final action is taken regional meetings will be held in New York, Fort Worth, Kansas City, and Los Angeles, and an analysis of these meetings will be conducted in Washington.

## Portuguese Carrier to Buy Super Connies

The Portuguese airline Transportes Aereos Portugueses has decided to order Lockheed Super Constellations in connection with its route expansion, probably for use between Lisbon and Rio de Janeiro. TAP is scheduled to start service from Lisbon to Luanda, Johannesburg, and Laurencio Marques in May, with twice weekly flights of Douglas DC-4's.

## Dutch Firm Gets F-84 Maintenance Contract

Overhaul and maintenance of Republic F-84F Thunderjets supplied to Holland under MDAP will be handled by the Dutch firm of Industriemaatschappij Avio-Diepen N. V., according to the terms of a contract that has been signed between that firm and Republic Aviation International, S. A., of Lugano, Switzerland.

The latter company will supply the necessary tooling and technical assistance. Parts will come either from Republic at Farmingdale, from Finnmeccanica of Naples, Italy, or from SNCASE of Paris.

## Fifty Modifications Due for Comets

Some 50 modifications will be made to the Comet I and IA before those aircraft are returned to passenger service by BOAC, Air France, and UAT. Armor plate will be placed between the turbine blades and the fuel tanks, extra fire detectors will be installed, and an additional lightning conductor will be fitted on the fin.

A redesigned wing leading edge will also be fitted to one of Air France's three Comets.

Other changes include venting the electric battery to the outside atmosphere, special metal-braided reinforced fuel pipes, improved engine breathers, an extra temperature gauge in the equipment bay, ducting of air to electric motors, improved ventilation of rear-fuselage under-floor zones, reduced fin spark gap, removal of rudder trailing edge strip, reinforced wiring to sense antenna amplifier in aileron booster bay, and larger clips on booster pump conduits.

## Investment Firm Cuts Airline Holdings

Airline investments held by the National Aviation Corp. of New York, one of the larger investment houses dealing extensively in aviation stocks, have been cut from 33.7% to 24.3% of total assets, as of December 31.

The company advised its stockholders that it eliminated entirely its holdings of 25,000 Pan American shares and 10,000 Braniff shares, cut its United Air Lines shares by 6500, but increased its Eastern Air Lines holdings by 7400 shares.

On the manufacturing side, the firm eliminated its holdings in Martin and Grumman; reduced its shares in Republic, Bell, Boeing, Lockheed, United Aircraft, and the Garrett Corp; and increased its stake in North American, Douglas, G. M. Giannini, and Collins Radio.

## Britannia Crash-Lands After Engine Fire

The second prototype of the Bristol Britannia caught fire in the air and crash-landed on a mud flat in the River Severn near Bristol on February 4. The crew of 10 and four passengers, including two representatives of KLM, survived the crash, but the airplane was damaged so badly that repair will not be possible. The test program will be delayed six months.

## More Air France Comets

Three more Comet II's have been ordered by Air France, it has been revealed by de Havilland. The carrier had earlier ordered three Comet I's and three Mark II Comets. The former entered service last August.

## Hubbard of ATA Dies

Charles C. Hubbard, Jr., 43, vice president of traffic for the Air Transport Association, died February 1. Convalescing at home after a back operation, Hubbard is believed to have gone to sleep while smoking in bed and, awakening, to have stabbed himself to relieve the suffering from severe burns. He is also believed to have taken sleeping pills.

Hubbard joined ATA in 1939 and became vice president of traffic in December, 1952, succeeding the late M. F. Redfern.

## Members of Senate Subcommittee Named

The members of the Senate Commerce Committee's new aviation subcommittee have been announced by Chairman John W. Bricker (R., O.) as follows: Senators Griswold (Nebr.), Duff (Pa.), and Payne (Me.) for the Republicans; Senators Monroney (Okla.) and Smathers (Fla.) for the Democrats.

## BLS Reports Drop in Airline Employment

Employment in the airline industry, which had been rising steadily since the Korean conflict to set new peaks month after month, finally turned downward last fall.

The Bureau of Labor Statistics in its December, 1953, issue of "Employment and Payrolls" gave airline employment as 105,100 in August, 105,500 in September, and 106,000 in October. But the same agency's January issue changed the figures on the basis of more complete reports to read 104,800 in September, 104,700 in October, and 104,400 in November.

At the same time, BLS noted a decline of 30,000 aircraft and parts workers between October and November. Most of this can be accounted for by the walkout of CIO-Autoworkers at three North American Aviation plants between October 22 and mid-December.

## FTL Asks Wider Permanent Certificate

The Flying Tiger Line has requested permission to engage in all sorts of air transportation except the common carriage of passengers. It has also asked for permission to carry passengers on charters and other special flights and for addition of Salt Lake City and North Platte as intermediate points.

The Tigers' current all-cargo certificate is due to expire on August 12, 1954.

## Propose Extension of Local Lines Experiment

Extension of the local service airlines' surface mail experiment through December 31, 1954, has been proposed by the CAB. The Board named the same 30¢-per-ton-mile rate at which the local lines participated in a Christmas holiday experiment. The local lines asked for an extension after the experiment ended on January 11.

## Short Hauls Major Problem for BEA

Short hauls, high landing fees, high fuel taxes, and the costs incident to the introduction of new aircraft types are keeping British European Airways "beset by financial headaches," according to chief executive Peter G. Masfield.

Average one-way fare on BEA is \$20.58; average fares for 10 other leading IATA airlines range between \$27.00 (Eastern) and \$219.80 (BOAC). Average distance flown by BEA passengers is 283 miles, while the other 10 airlines average 750 miles, Masfield revealed.

## Hurley Scores Low Industry Earnings

Given the same opportunity to earn money enjoyed by other industries, the aircraft industry would be capable of expanding its production capacity by 360% within a single year to meet mobilization requirements without government help, according to Roy T. Hurley, president of Curtiss-Wright Corp.

In four consecutive days earlier this month Hurley addressed several hundred bankers, industry heads, and reporters who were called to the Waldorf Astoria Hotel in New York for a briefing on C-W's activities and hopes.

Hurley said his company would spend \$50-\$60 million on plant expansion and new machinery today if general economic conditions permitted. This is not possible he said, because of the government policy to hold aircraft company earnings to a bare minimum.

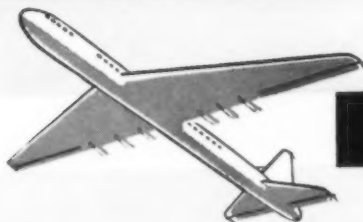
Best index to the aircraft industry's deplorable financial condition, he indicated, is the growth of net worth in this versus other large industries.

While leading manufacturers have enjoyed a 93.6% growth in net worth since 1943, and the larger automobile manufacturers a 96.7% increase, aircraft companies have seen only 54.4% growth. This figure reflects the low net return on sales experienced by aircraft manufacturers, who got only 1.7% return, as against 5.9% for large automotive manufacturers and 6.1% for other leading manufacturers.

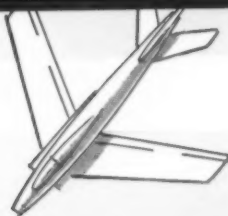
Hurley attributed much of this trouble to a general belief that the aircraft industry has no investment of its own and that the government heavily subsidizes the aircraft industry. Hurley said that \$72 million of the \$300 million required by C-W for the expansion of facilities accompanying the Korean War was supplied by the company.



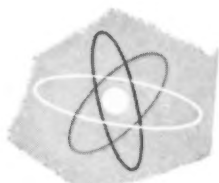
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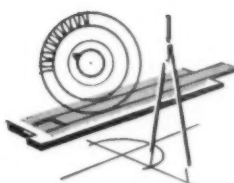
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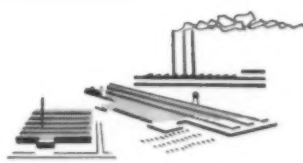
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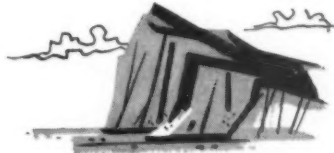
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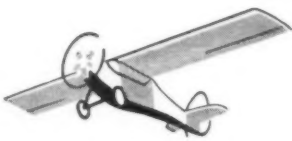
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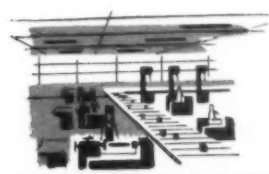
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